

CALIFORNIA ENERGY COMMISSION

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The staff of the California Energy Commission hereby submits its Final Staff Assessment (FSA) for the Metcalf Energy Center, a 600-megawatt, natural gas-fired electric generation facility proposed for south San Jose. This document contains our testimony for the upcoming evidentiary hearings of the Energy Commission that will occur later this year. It is staff's responsibility to complete an independent assessment of the project's potentially significant effects on the environment, public health and safety, and whether it conforms to applicable legal requirements. This assessment also includes recommended conditions of certification to mitigate potential effects of the project. The analyses were prepared in accordance with Public Resource Code Sections 25500 et seq.; the California Code of Regulations (CCR) Title 20, Sections 12001 et seq.; and the California Environmental Quality Act (PRC//21000 et seq.) and its guidelines (CCR title 14//15000 et seq.).

The City of San Jose plans to use the FSA for the environmental review associated with the City's actions related to Calpine Corporation/Bechtel Enterprises application for a general plan amendment and request for a change in the land-use zoning of the proposed 20-acre Metcalf Energy site. The City of San Jose expects to hold these hearings later in the year.

After careful consideration, Energy Commission staff concludes that the project (1) has the potential to result in significant adverse impacts with respect to land use and visual resources, and (2) will result in substantial electric system benefits. Energy Commission staff believe that the significant local electrical system benefits and consumer benefits, the use of reclaimed water for cooling and the dedication in perpetuity of 130 acres of habitat for the endangered bay checkerspot butterfly outweigh the project's potential impacts. Therefore, considering the limitations of the electric transmission system to provide electric resources to the greater San Jose area, the acute need for reliable electricity to meet the increasing demands of a growing area, the mandate of the State to ensure a safe and reliable supply of electricity to maintain the health, safety and welfare of the people of the state and the state economy, and the timing and feasibility of the project relative to other alternatives; the staff recommends approval of the project (see the Executive Summary for a further discussion).

Copies of this document are available by contacting Luz Manriquez-Uresti, California Energy Commission, 1516 Ninth Street, MS-15, Sacramento, CA 95814-5512, phone (916) 654-3928. This document is also available on the Internet at:

(<http://www.energy.ca.gov/sitingcases/metcalf>).

Persons wanting information on how to participate in the Energy Commission's hearings should contact Ms. Roberta Mendonca, the Energy Commission's Public Adviser, at (916) 654-4489, or (800) 822-6228. Technical or project schedule questions should be directed to Paul Richins, Energy Commission Project Manager, at (916) 654-4074. News media inquiries should be directed to Assistant Executive Director, Claudia Chandler, at (916) 654-4989.

DATE: _____

ROBERT L. THERKELSEN, Deputy Director for
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Final Staff Assessment

**CALIFORNIA
ENERGY
COMMISSION**

METCALF ENERGY CENTER

Application For Certification 99-AFC-3
City of San Jose,
Santa Clara County

STAFF REPORT

OCTOBER 2000
(99-AFC-3)



Gray Davis, Governor

Final Staff Assessment

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Santa Clara County

STAFF REPORT

OCTOBER 2000
(99-AFC-3)



Gray Davis, Governor

**CALIFORNIA
ENERGY
COMMISSION**

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EXECUTIVE SUMMARY

This report contains the Energy Commission staff's independent analysis and recommendation on the Metcalf Energy Center (MEC). **This is not the decision document for these proceedings nor does it contain findings of the Energy Commission related to environmental impacts or the project's compliance with local/state/federal legal requirements.** The final decision including findings, will be made by the Commissioners of the California Energy Commission after completion of evidentiary hearings. During these hearings the Commissioners will consider the recommendations of all interested parties, including those of the Energy Commission staff in this document; the applicant; intervenors; concerned citizens; City of San Jose; and other local, state, and federal agencies, before making a final decision on Calpine/Betchel's application to construct and operate the nominal 600-megawatt, natural gas-fired Metcalf Energy Center.

It is the responsibility of the Energy Commission staff to complete an independent assessment of the project's potential effects on the environment, the public's health and safety, and whether the project conforms with all applicable laws, ordinances, regulations and standards (LORS). The staff also recommends measures to mitigate potential significant adverse environmental effects and conditions for construction, operation and eventual closure of the project, if approved by the Energy Commission. The analyses contained in this document were prepared in accordance with Public Resources Code Sections 25500 et seq.; the California Code of Regulations, Title 20, Sections 12001 et seq.; and the California Environmental Quality Act (Pub. Resources Code §§ 21000 et seq.) and its guidelines (Cal. Code Regs., tit. 14 §§ 15000 et seq.).

The Metcalf Energy Center and related facilities such as the electric transmission lines, natural gas line, water supply lines and wastewater lines are under the Energy Commission's jurisdiction (Pub. Resources Code § 25500). When issuing a license, the Energy Commission acts as lead state agency (Pub. Resource Code § 25519(c)) under the California Environmental Quality Act (Pub. Resource Code §§ 21000 et seq.), and its process is functionally equivalent to the preparation of an environmental impact report (Cal. Code Regs., tit. 14 § 15251(k)).

PROJECT LOCATION AND DESCRIPTION

On April 30, 1999, the Calpine Corporation and Bechtel Enterprises, Inc. filed an Application for Certification (AFC) seeking approval from the California Energy Commission (Energy Commission) to construct and operate the Metcalf Energy Center (MEC), a nominal 600-megawatt (MW), natural gas-fired, combined cycle electric generation facility. On June 23, 1999, the California Energy Commission accepted the AFC as complete. On October 1, October 15, 1999, and February 15, 2000, Calpine/Bechtel filed supplements A, B and C amending its original proposal in response to input from the public and the City of San Jose. Additional information was provided in response to information requests through September 2000.

The proposed site is located partially in the City of San Jose and partially in the County of Santa Clara near Highway 101 in the south part of San Jose (see **PROJECT DESCRIPTION Figure 1**). The site lies at the southern base of Tulare Hill in northern Coyote Valley to the west of Monterey Highway and south of the Metcalf Road intersection. The 20-acre site is currently zoned for agricultural uses by both the city and county.

Calpine/Bechtel's proposed power plant design consists of two 285-MW combustion turbine generators (CTG), each equipped with steam injection power augmentation capabilities; two heat recovery steam generators (HRSG) with duct burners; a single 235 MW condensing steam turbine generator; a mechanical draft (wet/dry) plume-abated cooling tower; and a 230-kilovolt (kV) switching station. The combustion turbine trains will include 145-foot exhaust stacks at the southern end of the site and step-up transformers, HRSG units, steam turbine generator units and their transformers, and water treatment and cooling towers.

Nitrogen oxide (NO_x) emissions from the combustion process will be controlled to no more than 2.5 parts-per-million by volume dry (ppmvd) corrected to 15 percent oxygen by utilizing dry low NO_x combustion technology in the CTGs and a selective catalytic reduction (SCR) system for the HRSGs. The SCR system will use aqueous ammonia for the reduction process.

Additional facilities proposed as part of this project include an administration building with control room, storage tanks, parking area, water treatment building, a switchgear building and a warehouse/maintenance shop. Calpine/Bechtel may also install a temporary rail spur from the adjacent Union Pacific Railroad to accommodate delivery of heavy equipment during construction.

The proposed power plant is adjacent to existing PG&E transmission lines that are connected to the Metcalf Substation. Electricity generated by MEC will be delivered to the transmission grid via a new 230-kV transmission line approximately 240 feet in length. The overhead transmission line will connect into PG&E's existing 230-kV Metcalf-Monte Vista No. 4 line which runs east-west along the northern edge of the project boundary.

Calpine/Bechtel proposes to use approximately 2.9 to 5.8 million gallons a day of recycled water for cooling purposes from the San Jose/Santa Clara Water Pollution Control Plant as part of the South Bay Water Recycling Program. This will necessitate the construction of a new 10.2-mile recycled water supply line (the "SBWR Route"). A combined industrial wastewater and sanitary sewer line (less than a mile in length) will be constructed along Fisher Creek to the City's existing sanitary sewer line that runs along Santa Teresa Boulevard. Fresh water will be supplied either by the San Jose Municipal Water System or Great Oaks Water District from wells located in Coyote Valley. The applicant has not selected a water purveyor to date.

During baseload operations, it is expected that the project will use a maximum of 100,522 MMBtus/day of natural gas. The applicant proposes to build a new 16-inch diameter fuel gas pipeline from the MEC to PG&E's existing Line 300, a major

natural gas transmission line along the eastern side of US 101. The proposed gas pipeline is sized to permit operation of the turbines and duct burners at full power.

Calpine/Bechtel estimates the capital costs of the Metcalf Energy Center to be \$300-\$400 million. The applicant expects to employ a peak construction workforce of about 400 over a two-year period and a permanent workforce of 20 for plant operation. Construction payroll is estimated to be about \$40.8 million, while annual operations payroll is expected to be \$1 million.

If approved, construction of the MEC, from site preparation to commercial operation is expected to take approximately 18-22 months.

PUBLIC AND AGENCY COORDINATION

The Metcalf Energy Center is proposed on land currently zoned for agriculture and is designed for campus industrial uses in the City of San Jose's general plan. Consequently, Calpine/Bechtel has applied to the City of San Jose for a change in the general plan and zoning designation. For the City of San Jose to make a determination to change the general plan and zoning, an environmental document is required. The City of San Jose plans to use this document as the environmental document that must be considered in reaching a decision. As such, this analysis has been coordinated with the City of San Jose staff.

Publicly noticed workshops on air quality, water resources, biological resources, project site alternatives, and transmission system engineering were held in San Jose prior to the completion of the Preliminary Staff Assessment (PSA). Several of these workshops were jointly sponsored by the Energy Commission staff and the City of San Jose District 2 Metcalf Energy Center Advisory Committee. After the PSA was issued on May 15, 2000, six days and four evenings of workshops were held to receive comments on that draft document. In total, 20 publicly-noticed workshops and meetings have been held by staff in the San Jose area to understand the issues and concerns of the public and other government agencies. Many helpful comments were received from concerned citizens, the City of San Jose, Santa Clara County, California Native Plant Society, intervenors, and the applicant.

In addition to these workshops, extensive coordination has occurred with the numerous local, state and federal agencies that have an interest in the project. Particularly, Energy Commission staff has worked with the California Independent System Operator (Cal-ISO), Bay Area Air Quality Management District, California Air Resources Board, U.S. Environmental Protection Agency, U.S. Fish and Wildlife Service, and California Department of Fish to identify and resolve issues of concern.

Written PSA comments received from local, state, and federal agencies and concerned citizens, along with staff's response to each, have been included in this assessment. Written and verbal comments from the applicant and intervenors were carefully considered and incorporated into the analysis where appropriate.

CONCLUSIONS

If the Commission decides to approve the project, staff has proposed 192 conditions of certification to ensure that the facility is constructed and operated in a safe and reliable manner and potential impacts are mitigated to the greatest extent feasible. Each technical area in the Final Staff Assessment (FSA) includes a discussion of the project and the existing environmental setting; the project's conformance with laws, ordinances, regulations and standards (LORS) and whether the facility can be constructed and operated safely and reliably; project specific and cumulative impacts; the environmental consequences of the project using the proposed mitigation measures; conclusions and recommendations; and any proposed conditions of certification under which the project should be constructed and operated.

CONSUMER BENEFITS AND LOCAL ELECTRIC TRANSMISSION SYSTEM EFFECTS

The staff of the Energy Commission and the Cal-ISO have completed an analysis of the local electric transmission system effects of the project. This analysis concludes that the project, as proposed, will provide substantial benefits to consumers, industry and the electric transmission system in the greater San Jose area. These benefits include a reduction of 39 megawatts and 81 gigawatt hours of transmission system losses, increased reliability, improved voltage support, and a reduction in the risk of rolling blackouts which the State of California and the greater San Jose area potentially face due to serious electricity shortages. Some of these benefits are listed below. (Refer to the chapter on Local System Effects for a full discussion.)

- The addition of the MEC project significantly reduces system losses that would otherwise result from transporting power in the transmission system. Due to the location of the MEC near the San Jose load center, loss savings of 39 megawatts (MW) and 81 gigawatt hours (GWh) valued between \$23 to \$34 million would be realized. This means that 39 MW and 81 GWh, instead of being dissipated as heat losses in the delivery of power across the transmission lines, are available to consumers with no new transmission lines, no additional consumption of water and fuel, and no additional impacts to water quality, water use, and biological resources. With an electric system that operates more efficiently, system wide costs can be reduced resulting in benefits to businesses and consumers.
- The MEC provides a significant source of real and reactive power to serve loads in the South Bay Area. This will substantially reduce the need for imported power over stressed transmission facilities and reduce the need for additional substation upgrades to prevent voltage collapse and rolling blackouts.
- The MEC provides a substantial increase in the local area's reactive reserve margins resulting in a significant increase in local area reliability and will assist in the maintenance of interconnected system reliability thereby reducing the potential for future voltage collapse or rolling blackouts.
- The MEC may result in deferral or relocation of substantial capital facilities planned or currently located in the South Bay Area and Greater Bay Areas. These capital facilities involve tens of millions of ratepayer dollars. In addition,

the deferral or the elimination of linear facilities can result in deferral or elimination of the environmental impacts associated with tens of miles of such construction.

In a September 1, 2000, letter to the Energy Commission, Terry M. Winter, President and Chief Executive Officer of the California ISO, strongly encouraged the Commission to expedite the review of the Metcalf Energy Center as the "ISO believes that the MEC will provide substantial reliability benefits to the San Jose area sufficient to offset the impacts". Energy Commission staff agrees with the points made by Mr. Winter which are summarized below.

- There is an acute need for new power generation in the San Jose area and throughout California.
- The San Jose area is the most generation deficient in the state.
- The San Jose area is one of the areas most vulnerable to outages and reliability problems in the PG&E service territory.
- With the continued growth in demand, the ISO could be forced to implement rolling blackouts of customers, such as those experienced in the Greater San Francisco Bay Area and San Jose area on June 14, 2000.
- New electric generation at Metcalf will be a permanent means to defer these extreme measures.

AIR QUALITY

The analysis contained in the Final Determination of Compliance issued by the San Francisco Bay Area Air Quality Management District has been incorporated into the FSA. The San Francisco Bay Area Air Quality Management District believes that the project complies with the appropriate rules and requirements of the District and will not contribute to the degradation of the air quality in the San Francisco Bay Area Air Quality Management District.

Energy Commission staff has identified a number of local air quality issues and potentially significant impacts beyond those addressed by the San Francisco Bay Area Air Quality Management District permit. To mitigate these potential impacts, staff has proposed additional conditions of certification for PM-10 air quality offsets and construction machinery.

OVERVIEW OF POTENTIAL IMPACTS AND LEGAL REQUIREMENTS

It is staff's responsibility to complete an independent assessment of the project's potential effects on the environment and on the public's health and safety, and whether the project conforms to all applicable laws, ordinances, regulations and standards (LORS). The staff also recommends measures to mitigate all identified, potentially significant environmental effects of the project. Staff's analysis indicates that the project's environmental impacts are fully mitigated to levels of less than significant in all areas except for visual resources and land use, and that the project complies with all legal requirements (laws, ordinances, regulations and standards (LORS)) in all technical areas except for land use and visual resources. Below is a

summary of the potential environmental impacts and LORS compliance for each technical area.

Technical Discipline	Environmental Impact	LORS Conformance
Air Quality	fully mitigated	Yes
Biological Resources	fully mitigated	Yes
Cultural Resources	none	Yes
Power Plant Efficiency	none	n/a
Power Plant Reliability	none	n/a
Facility Design	none	Yes
Geology	none	Yes
Hazardous Materials	fully mitigated	Yes
Land Use	yes	No
Noise	fully mitigated	Yes
Public Health	fully mitigated	Yes
Socioeconomics	none	Yes
Traffic and Transportation	fully mitigated	Yes
Transmission Line Safety	none	Yes
Transmission System Engineering	none	Yes
Visual Resources	yes	No
Waste Management	none	Yes
Water and Soils	fully mitigated	Yes
Worker Safety	none	Yes

POTENTIAL PROJECT IMPACTS

Energy Commission staff believe that the project's construction and operation impacts can be mitigated to a level less than significant in all areas except for land use and visual resources. (Note: these are not the official findings of the Energy Commission but staff's conclusions on its assessment of the project.) The areas of potential impact are described below.

- Land Use—the project has the potential for a significant and unmitigated adverse impact on agriculture because it would convert about 20 acres of prime farmland to non-agricultural uses.
- Land Use—a project is considered to be compatible with existing and planned land uses if it does not cause significant unmitigated noise, public health and safety, hazardous materials handling, traffic, and visual resource impacts. In this case, the project would be compatible in terms of the above effects except for visual resource impacts.
- Visual Resources—the project has the potential for unmitigable adverse visual impacts in three areas. Staff found that the project would have direct impacts on the views from the Blanchard Road area, degrade the general visual character and quality of the area, and when considered with Cisco Systems planned development, contribute to a cumulative impact.

CONFORMANCE WITH LORS

Calpine/Bechtel has demonstrated that the project will conform to all local, state and federal legal requirements (LORS) except for two areas—land use and visual resources. The areas of potential nonconformance are described below.

- Land Use—since the proposed site is planned for campus industrial uses and zoned for agriculture, Calpine/Bechtel has applied for a general plan amendment, rezoning of the land and annexation to the City of San Jose. This request is currently being reviewed by the City of San Jose and a vote by the City Council is expected in the fall, 2000. If the City of San Jose approves these requests, the project would be in conformance with the general plan.
- Land Use—the proposed project would be consistent with 23 applicable general plan strategies, policies, development guidelines and standards. The project would be inconsistent with three development guidelines. However, the environmental impacts of the project these guidelines are intended to avoid would be less than significant.
- Visual Resources—the project has the potential to conflict with a number of policies and guidelines adopted by the City of San Jose.

ALTERNATIVES

It is important to note that the Energy Commission's authority is limited to either approving or denying the MEC at the site proposed by Calpine/Bechtel. The Commission does not have the authority to approve the project at one or more alternative sites or to require the Calpine/Bechtel to move the proposed project to another location. If Calpine/Bechtel decides to build a power plant at another site, other than the originally proposed site, a new Application for Certification must be filed and the review process would begin anew on that site. Considering the time it would take to develop a new AFC, the Energy Commission review process and construction time, a plant, if approved, would not begin producing electricity for the grid until 2005, at the earliest. Moreover, it is entirely conceivable that some or all of the alternative sites may, upon more rigorous examination, prove unsuitable.

Staff's assessment describes a range of reasonable alternatives to the proposed project, or to the location of the project, that could feasibly attain most of the basic project objectives but would avoid or substantially lessen any of the significant effects of the project. The assessment also evaluates the comparative advantages and disadvantages of the various alternatives in less detail than the analysis of the project, but in a manner to inform the decision making process.

Staff identified and reviewed 17 alternative sites, all of which have their own set of unique issues and potential impacts. Several alternative sites appear to lessen the adverse land use and visual impacts associated with MEC. However, a project proposed for any one of these sites would not be in conformance with all local land use requirements, and may have issues regarding environmental justice and visual impacts. Although the use of an alternative site may appear to lessen or avoid the impacts of the project, a more detailed site analysis may show otherwise. Since the alternative site analysis was less detailed than the FSA assessment of the MEC

site, we would caution that a more rigorous AFC-type analysis of an alternative site could reveal additional non-conformity with LORS or environmental impacts that were missed during the more general alternatives analysis¹.

In addition, a project located at an alternative site would not meet the critical project objective of providing generation-based reliability improvements in the San Jose area in 2002 or as soon thereafter as possible. The Independent System Operator has identified MEC as a time-critical project. If approved and constructed, MEC would enhance the reliability of an imperiled electric system. Recent events have emphasized the need for more generation throughout the state to enhance reliability and relieve high prices driven by insufficient supply. The proposed project addresses this critical objective in the near term. The alternatives cannot.

RECOMMENDATIONS

After careful consideration, Energy Commission staff concludes that the benefits resulting from the approval of the Metcalf Energy Center would be substantial. The significant local electrical system benefits and consumer benefits, the use of reclaimed water for cooling, and the dedication in perpetuity of 130 acres of habitat for the endangered bay checkerspot butterfly outweigh the potentially significant visual and land-use impacts of the project. Therefore, considering the limitations of the electric transmission system to provide electric resources to the greater San Jose area, the acute need for reliable electricity to meet the increasing demands of a growing area, the mandate of the State to ensure a safe and reliable supply of electricity to maintain the health, safety and welfare of the people of the state and the state economy, and the timing and feasibility of the project relative to other alternatives, staff recommends approval of the project.

¹ It is exceedingly difficult to identify locations near load centers that are acceptable to the local community and do not have significant impacts. This is illustrated by the fact that there are few major generation sources in the greater San Jose area. This is further demonstrated by the fact that the Energy Commission does not have any other applications for permanent generation in the greater San Jose area even though the area's current load and expected load growth would benefit greatly by not one, but several other, new electric generation facilities.

METCALF ENERGY CENTER
FINAL STAFF ASSESSMENT

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INTRODUCTION

On April 30, 1999, the Calpine Corporation and Bechtel Enterprises, Inc. filed an Application for Certification (AFC) seeking approval from the California Energy Commission (Energy Commission) to construct and operate the Metcalf Energy Center (MEC), a 600 megawatt (MW), natural gas-fired, combined cycle power plant. On June 23, 1999, the California Energy Commission found the AFC to be data adequate. A finding of data adequacy by the Commission begins staff's analysis of the project.

On October 1, 1999, October 15, 1999, and February 15, 2000 Calpine/Bechtel filed supplements A, B and C to their application. Many of the changes in the project were in response to input they received from the public and the City of San Jose. Additional information was provided in response to information requests received through September 2000.

The Final Staff Assessment (FSA) presents the California Energy Commission (Energy Commission) staff's independent analysis of Calpine Corporation and Bechtel Enterprise's (Calpine/Bechtel) Application for Certification. The primary responsibility of the California Energy Commission staff is to complete an independent assessment of the project's potential effects on the environment, the public's health and safety, and whether it conforms with all applicable laws, ordinances, regulations and standards (LORS). The staff also recommends measures to mitigate any identified, potential effects of the project. The FSA is prepared pursuant to Title 20, California Code of Regulations, sections 1742, 1742.5, 1743 and 1744.

The FSA is a staff document and is not a decision document pertaining to MEC. The final decision will be made by the California Energy Commission after completion of evidentiary hearings.

ORGANIZATION OF THE REPORT

The FSA describes the following:

- the proposed project;
- the existing environmental setting;
- whether the facilities can be constructed and operated safely and reliably in accordance with applicable laws, ordinances, regulations and standards (LORS);
- the environmental consequences of the project, including potential public health and safety impacts;
- cumulative analysis of the potential impacts of the project, along with potential impacts from other existing and known planned developments;
- mitigation measures proposed by the applicant, staff, interested agencies and intervenors that may lessen or eliminate potential direct and cumulative impacts;
- proposed conditions under which the project should be constructed and operated, if it is certified; and
- project alternatives.

The analyses contained in this FSA are based upon information from: 1) the AFC; 2) supplements to the AFC; 3) responses to data requests; 4) information from local and state agencies; 5) concerned citizens; 6) existing documents and publications; and 7) independent field studies and research. The analyses for most technical areas include discussions of proposed conditions of certification. Each proposed condition of certification is followed by a proposed means of “verification”. The verification is the Energy Commission Compliance Unit’s method of ensuring post-certification compliance with adopted requirements. The FSA presents recommended conclusions and proposed conditions of certification that apply to the design, construction, operation and closure of the proposed facility.

The FSA contains an Executive Summary, Introduction, Project Description, Project Alternatives, Local Electric Transmission System Effects, and Responses to Public and Agency Comments. The environmental, engineering, and public health and safety analysis of the proposed project is contained in 19 technical areas. Each technical area is included in a separate chapter and are as follows: Air Quality, Public Health, Worker Safety and Fire Protection, Transmission Line Safety, Hazardous Material Management, Waste Management, Land Use, Traffic and Transportation, Noise, Visual Resources, Cultural Resources, Socioeconomic Resources, Biological Resources, Soil and Water Resources, Geology and Paleontology, Facility Design, Reliability, Efficiency, and Transmission System Engineering. These chapters are followed by a discussion of facility closure, project construction and operation compliance monitoring plans, and a list of staff that assisted in preparing this report.

Each of the 19 technical area assessments includes a discussion of:

- laws, ordinances, regulations and standards (LORS);
- the regional and site-specific setting;
- project specific and cumulative impacts;
- mitigation measures;
- closure requirements;
- conclusions and recommendations; and
- conditions of certification for both construction and operation (if applicable).

ENERGY COMMISSION SITING PROCESS

The California Energy Commission has the exclusive authority to certify the construction and operation of thermal electric power plants 50 megawatts (MW) or larger. The Energy Commission certification is in lieu of any permit required by state, regional, or local agencies, and federal agencies to the extent permitted by federal law (Pub. Resources Code, section 25500). The Energy Commission must review AFCs to assess potential environmental impacts including potential impacts to public health and safety, potential measures to mitigate those impacts (Pub. Resources Code, section 25519), and compliance with applicable governmental laws or standards (Pub. Resources Code, section 25523 (d)).

The Energy Commission's siting regulations require staff to independently review the AFC and assess whether the list of environmental impacts contained is complete, and whether additional or more effective mitigation measures are necessary, feasible and available (Cal. Code Regs., tit. 20, sections 1742 and 1742.5(a)).

In addition, staff must assess the completeness and adequacy of the health and safety standards, and the reliability of power plant operations (Cal. Code Regs., tit. 20, section 1743(b)). Staff is required to develop a compliance plan (coordinated with other agencies) to ensure that applicable laws, ordinances, regulations and standards are met (Cal. Code Regs., tit. 20, section 1744(b)).

Staff conducts its environmental analysis in accordance with the requirements of the California Environmental Quality Act (CEQA). An Environmental Impact Report (EIR) is not required as the Energy Commission's site certification program has been certified by the Resources Agency (Public Resource Code, section 21080.5 and Cal. Code Regs. tit. 14, section 15251 (k)). The Energy Commission acts in the role of the CEQA lead agency and is subject to all other portions of CEQA.

Staff prepared both a preliminary and final staff assessment. The Preliminary Staff Assessment (PSA) included a draft assessment and conclusions, and preliminary conditions of certification for review and comment by the applicant, intervenors, agencies, other interested parties and members of the public. Staff used the PSA to resolve issues between the parties and to narrow the scope of adjudicated issues in the evidentiary hearings. During the period between publishing the PSA and the FSA, staff conducted a series of workshops in San Jose to discuss their findings, proposed mitigation, and proposed compliance monitoring requirements. Based on the workshops and written comments, staff refined their analysis, corrected errors, and finalized conditions of certification.

Staff's assessment is only one piece of evidence that will be considered by the Committee (two commissioners who have been assigned to a specific project) in reaching a decision on whether or not to recommend that the full Energy Commission approve the proposed project. At the publicly-noticed evidentiary hearings all parties will be afforded an opportunity to present evidence, cross examine witnesses, and to rebut the testimony of other parties, thereby creating an evidentiary hearing record on which a decision on the project can be based. The hearing before the Committee also allows all parties to argue their positions on disputed matters and it provides a forum for the Committee to receive comments from the public and other governmental agencies.

Following the hearings, the Committee's recommendation to the full Energy Commission on whether or not to approve the proposed project will be contained in a document entitled the Presiding Members' Proposed Decision (PMPD). Following publication, the PMPD is distributed in order to receive written public comments. At the conclusion of the comment period, the Committee may prepare a revised PMPD. A revised PMPD is required to undergo a 15-day comment period. At the close of the comment period for the revised PMPD, the PMPD is submitted to the

full Energy Commission for a decision. Within 30 days of the Energy Commission decision, any party may appeal the decision to the Energy Commission.

A Compliance Monitoring Plan and General Conditions will be assembled from conditions contained in the FSA and other evidence presented at the hearings. The Compliance Monitoring Plan and General Conditions will be presented in the PMPD. The Energy Commission staff's implementation of the plan ensures that a certified facility is constructed, operated, and closed in compliance with the conditions adopted by the Energy Commission. The proposed Compliance Monitoring Plan and General Conditions are included in the FSA.

PUBLIC AND AGENCY COORDINATION

The Metcalf Energy Center is proposed for land not currently zoned for a power plant. Consequently, Calpine/Bechtel has applied to the City of San Jose for a change in the general plan, zoning designation and annexation to the City of San Jose. For the City of San Jose to make a determination to change the general plan and zoning, an environmental document is required. The City of San Jose has agreed to use the Energy Commission's FSA as their environmental document on which to base their decision. As such, the analysis has been closely coordinated with the City of San Jose.

Publicly noticed workshops on air quality, water resources, biological resources, project site alternatives, and transmission system engineering were held in San Jose prior to the completion of the PSA. Several of these workshops were jointly sponsored by the Energy Commission staff and the City of San Jose District 2 Metcalf Energy Center Advisory Committee. These workshops were productive and well attended by the public.

After release of the PSA on May 15, 2000, six days and four evenings of workshops on the PSA were held in south San Jose during June. During, approximately 50 hours of workshops, the applicant, intervenors, agencies, the public, and staff discussed the PSA and outstanding issues. Written comments on the PSA that were received from the public and local, state, and federal agencies are specifically addressed in the FSA.

In addition to these workshops, extensive coordination has occurred with the numerous local, state and federal agencies that have an interest in the project. Particularly, Energy Commission staff has worked with the City of San Jose, California Independent System Operator (Cal-ISO), Bay Area Air Quality Management District, California Air Resources Board, U.S. Environmental Protection Agency, and the Regional Water Quality Control Board to identify and resolve issues of concern. We have also coordinated the review and analysis of the project with U.S. Fish and Wildlife Service, Department of Fish and Game, U.S. Army Corp of Engineers, intervenors, and the interested residents of the community.

PROJECT DESCRIPTION

Calpine Corporation and Bechtel Enterprises, Inc., a partnership, is seeking approval from the California Energy Commission (Energy Commission) to construct and operate the Metcalf Energy Center (MEC), a 600 megawatt (MW), natural gas-fired, combined cycle power plant. Note that this nominal rating is based on preliminary design information and generating equipment manufacturers' guarantees. The project's actual maximum generating capacity will differ from, and likely exceed, this nominal megawatt rating.

Calpine/Bechtel estimates the capital costs of the Metcalf Energy Center to be \$300-\$400 million. The applicant expects to employ a peak construction workforce of about 400 over a two-year period and a permanent workforce of 20 for plant operation. Construction payroll costs are estimated to be \$40.8 million, while annual operations payroll is expected to be \$1 million.

If approved, construction of the MEC, from site preparation to commercial operation is expected to take approximately 18 months. The applicant anticipates commercial operation by the summer of 2003.

Calpine/Bechtel is developing the MEC to sell electricity in California's electricity market. Overall anticipated availability for the MEC is between 92 and 98 percent, operating approximately seven days a week, 24 hours a day. The proposed project is a merchant facility, not owned by a utility or its affiliate.

PROJECT LOCATION

As proposed by Calpine/Bechtel., the MEC site is located partially in the City of San Jose and the County of Santa Clara (see **PROJECT DESCRIPTION Figure 1**). The site lies at the southern base of Tulare Hill in northern Coyote Valley to the west of Monterey Highway and south of the Metcalf Road intersection. The site is bordered by Fisher Creek to the north and west and the Union Pacific Railroad right-of-way to the east. Blanchard Road is to the south.

The applicant proposes to construct the 600-megawatt, combined cycle, power plant on 20 acres (that lies partially in the County of Santa Clara and partially in the City of San Jose). During the construction phase, Calpine/Bechtel also proposes a temporary 20-acre construction lay down area adjacent to and south of the proposed power plant site. The site is currently zoned for agricultural uses.

PROJECT DESCRIPTION AND LINEAR FACILITIES

Calpine/Bechtel's proposed power plant design consists of two combustion turbine generators (CTG) capable of generating a maximum of 200 MW, equipped with steam injection power augmentation capabilities; two heat recovery steam turbine generators (HRSG) with duct burners; a single condensing steam turbine generator (STG) capable of generating a maximum of 235 MW; a mechanical draft (wet/dry) plume-abated cooling tower; and a 230-kilovolt (kV) switching station. Natural gas

is burned in the combustion turbine generators, which converts the thermal energy into mechanical energy required to drive the compressor and electric generator.

Modern gas turbines embody the most fuel-efficient electric generating technology available today. The “F-class” gas turbines to be employed in the MEC represent some of the most modern and efficient such machines now available. The thermal efficiency of the “F-class” gas turbines Calpine/Bechtel plans to use are approximately 55-56 percent (for further discussion, refer to the Power Plant Efficiency chapter).

Calpine/Bechtel plans to include elaborate architectural treatment (architectural screening/façade) around the Heat Recovery Steam Generators that is intended to make the plant consistent with the design qualities of the office structures planned for the adjacent industrial lands and to make the plant attractive in its own right.

A 900-foot 2-lane road and railroad crossing, built to city standards, will allow access to the site from Monterey Highway. The road will cross the Union Pacific Railroad right-of-way at Blanchard Road. Please see the **FACILITY DESIGN** section for a more detailed description. Calpine/Bechtel will construct a western access road if and when dedicated city streets are developed for the Coyote Valley Research Park and Calpine/Bechtel is granted the necessary rights to access this road system.

The two combustion turbine trains will include HRSG units with 145-foot exhaust stacks, a steam turbine generator unit and step-up transformers, and water treatment and cooling towers. Calpine/Bechtel proposes to locate the hybrid wet/dry cooling towers at the west end of the site and equip them with a plume abatement system to minimize the plume.

Nitrogen Oxide (NO_x) emissions from the combustion process will be controlled with state of the art combustion technology. Selective Catalytic Reduction (SCR) will further reduce NO_x to 2.5 parts-per-million by volume dry (ppmvd) corrected to 15 percent oxygen (rolling 3-hour average) and 2.0 ppmvd (annual average) by utilizing dry low NO_x combustion technology in the CTGs and a selective catalytic reduction (SCR) system for the HRSGs. The SCR system will use aqueous ammonia for the reduction process.

Additional facilities proposed as part of this project include an administration building with control room, storage tanks, parking area, water treatment building, a switchgear building and a warehouse/maintenance shop. Calpine/Bechtel may also install a temporary rail spur from the adjacent Union Pacific Railroad to accommodate delivery of heavy equipment during construction.

The linear facilities (electric transmission lines, natural gas line, and water supply lines) are described below and are depicted on the **PROJECT DESCRIPTION Figure 2 Local Setting** map.

ELECTRIC TRANSMISSION LINES

The proposed power plant is adjacent to existing PG&E transmission lines that are connected to the Metcalf Substation. Electricity generated by MEC will be delivered to the transmission grid via a new 230 kV transmission line approximately 200 feet in length. The overhead transmission line will connect into PG&E's existing 230 kV Metcalf-Monte Vista No. 4 line which runs east-west along the northern edge of the project boundary.

WATER SUPPLY

As described in their October 1, 1999 AFC supplement, Calpine/Bechtel proposes to use approximately 2.9 to 5.8 million gallons a day of recycled water for cooling purposes from the San Jose/Santa Clara Water Pollution Control Plant as part of the South Bay Water Recycling Program. This will necessitate the construction of a new 10.2-mile 20-inch recycled water supply line (the "SBWR Route"). The recycled water pipeline would begin north of the power plant site and weave its way along paved city streets, traveling primarily through residential and commercial areas, until reaching Fisher Creek at Santa Teresa Boulevard. South of Fisher Creek the recycled water pipeline would turn northeast, travelling through agricultural land on its way to the MEC site.

A combined industrial wastewater and sanitary sewer line (less than a mile in length) will be constructed along Fisher Creek to the City's existing sanitary sewer line that runs along Santa Teresa Boulevard. Back-up water will be supplied either by the San Jose Municipal Water System or from wells located on site or one mile south of the project. Domestic water supply pipelines include a 1.25-mile, 24-inch pipeline along the western portion of the railroad right-of-way from the MEC to San Jose MUNI Well 23 near Bailey Road and a pipeline from the MEC site to Great Oaks Water Company's system located in Santa Teresa Boulevard.

NATURAL GAS PIPELINE

During baseload operations, it is expected that the project will use a maximum of 99,000 MMBtus/day of natural gas. The applicant proposes to build a new 16-inch diameter fuel gas pipeline from the MEC to PG&E's existing Line 300, a major natural gas transmission line along the eastern side of US 101. The proposed gas pipeline is sized to permit operation of the turbines and duct burners at full power.

About one-third of the gas pipeline route is within the City of San Jose and the remainder is within unincorporated Santa Clara County. Existing land use along the proposed gas pipeline is primarily park, vacant, and agricultural land. The route traverses areas designated PL (Other Public Open Lands) and P (Regional Parks, Existing) on the County Land Use Plan and Campus Industrial on the San Jose Land Use Diagram.

**Project Description Figure 1
Regional Setting**

Project Description Figure 2
Local Setting

**Project Description Figure 3
Visual Simulation**

RESPONSE TO PUBLIC AND AGENCY COMMENTS

The following is an index of Preliminary Staff Assessment comments received from interested citizens and local governmental agencies. A few of the questions are answered directly below but most are addressed in the applicable technical section/chapter cross-referenced below. Responses appearing in separate chapters are included under the heading "Response to Public and Agency Comments". Following the index, is a photocopy of each interested citizen and public agency comment.

Additionally, applicant and intervenor comments have been considered by each author and have been included in the analysis where staff believes it is appropriate. Since the applicant and each intervenor are parties to the proceedings and will have an opportunity to present testimony and cross-examine witnesses at the evidentiary hearings, staff has not included a copy of the voluminous comments from intervenors and applicant.

AGENCY COMMENTS

DEPARTMENT OF PLANNING, CITY OF SAN JOSE

- SJ-1 General comments, Santa Clara County policies relevant for the linear facilities—see Land Use
- SJ-2 Land use and Economic Development—see Land Use and Socioeconomic Resources
- SJ-3 Land use development standards—see Land Use
- SJ-4 Soil and Water Resources—see Soils and Water resources
- SJ-5 Air Quality—see Air Quality
- SJ-6 Biological Resources—see Biological Resources
- SJ-7 Noise—see Noise
- SJ-8 Socioeconomics—see Socioeconomic Resources
- SJ-9 Visual Resources—see Visual Resources
- SJ-10 Traffic and Transportation—see Traffic and Transportation
- SJ-11 Hazardous Materials—see Hazardous Materials

PARKS AND RECREATION, COUNTY OF SANTA CLARA

- SC-1 Visual impacts on Coyote Ranch—see Visual Resources
- SC-2 Visual impacts from Fisher Creek Trail Corridor—see Visual Resources and Land Use
- SC-3 Biological impacts as a result of gas line construction—see Biological Resources and Land Use
- SC-4 Biological impacts as a result of project emissions—see Biological Resources

SANTA CLARA VALLEY CHAPTER, CALIFORNIA NATIVE PLANT SOCIETY, LIBBY LUCAS

- NPS-1 Impact to groundwater—see Soil and Water Resources

NPS-2 Depth of groundwater table—see Soil and Water Resources
NPS-3 Loss of trees and riparian habitat—see Biological Resources
NPS-4 Serpentine soils and the checkerspot butterfly—see Biological Resources
NPS-5 Impacts to biological resources in Fisher and Coyote Creeks—see Biological Resources
NPS-6 Noise impacts on biological resources in the riparian corridor—see Biological Resources
NPS-7 Tulare Hill land dedication—see Biological Resources
NPS-8 Recreational trails and wildlife—see Biological Resources
NPS-9 Hazardous materials stored at the site and potential for impacts—see Water Resources
NPS-9b Discharge or accidental release of “salty” waste recycled water into the creeks—see Soil and Water Resources
NPS-10 Chlorine and mercury at the plant—see Hazardous Materials Management
NPS-11 Nitrogen deposition and the checkerspot butterfly—Biological Resources
NPS-12 Increased fire danger on Coyote Ridge—see Biological Resources

PUBLIC COMMENTS (NON-INTERVIEWS)

SUE SWACKHAMER

SS-1 San Francisco Regional Water Quality Control Board—see Soil and Water Resources
SS-2 Santa Clara Valley Water District—see Soil and Water Resources
SS-3 San Jose Municipal Water System—see Soil and Water Resources
SS-4 Other proposed water pipelines—see Soil and Water Resources
SS-5 Water supply—see Soil and Water Resources
SS-6 Insure replacement—see Soil and Water Resources
SS-7 Soil and Water 1—see Soil and Water Resources
SS-8 Soil and Water 1, verification—see Soil and Water Resources
SS-9 Soil and Water 1, penalty—see Soil and Water Resources

SUZANNA WONG

SW-1 Public health—see Public Health
SW-2 Pollutant levels—see Public Health
SW-3 Cancer risk—see Public Health
SW-4 Underestimation of risks—see Public Health
SW-5 Protection of high-risk population groups—see Public Health
SW-6 RELs—see Public Health
SW-7 Diesel exhaust—see Public Health
SW-8 Power plant location—The location of a power plant is selected by the applicant prior to submitting an Application for Certification (AFC) to the Energy Commission. Calpine/Bechtel indicated in Metcalf Energy Center AFC that the reasons for selecting this specific site was to provide reliability and voltage support to the transmission system in the south San Francisco Bay area. They plan to sell electricity in the open market (Power Exchange). The Alternatives section of this document contains a discussion and comparison of various alternative forms of energy.

SW-9 Aqueous ammonia—see Hazardous Materials

SW-10 Natural gas explosion and fire—see Hazardous Material Management

SW-11 Natural gas accident records—see Hazardous Material Management

JULIE WEI

JW-1 Air quality degradation—see Air Quality

MICHAEL ROSENBLATT

MR-1 Conservation measures—Conservation measures are an important ingredient in the energy mix in California. The Energy Commission and the California Public Utilities Commission have many programs that encourage and assist in the funding of conservation measures. For more information on these conservation efforts see the Energy Commission web site www.energy.ca.gov and click on programs.

PHIL HOLDEN

PH-1 Environmental and health studies—The Energy Commission staff is charged with the responsibility of completing an independent assessment of the potential environmental impacts and the public health risks of the Metcalf Energy Center as well as all proposed thermal power plants 50 megawatts and greater in California. The studies/analysis provided by the Applicant are carefully reviewed and analyzed by the Commission staff. These reports are not the sole basis of our analysis but rather the starting point as we gather whatever data is necessary to come to an independent assessment and conclusion. The Energy Commission has more than twenty-five years of experience in which about 90 power plant proposals have been analyzed.

PH-2 Health risk for Nitrogen Dioxide—see Public Health

PH-3 Health risk for ammonia—see Public Health

PH-4 Carbon monoxide and the “smog” effect—see Air Quality

JOHN BARMETTLER

JB-1 Air quality degradation—see Air Quality

MICHAEL BALL

MB-1 Carbon Dioxide gases—see Air Quality

MB-2 Landscaping and compatibility with residential areas—There are many examples of power plants in residential neighborhoods that are good neighbors. However, that being said, the responsibility of the Energy Commission is to complete an independent assessment of the power plant project, and determine if there are potential significant impacts and whether these impacts can be mitigated to less than significant. Visual aesthetics and landscaping, and compatibility with nearby neighborhoods are just two aspects of the many areas that we carefully evaluate.

KATHY NAPOLI

KN-1 Hearings and inadequate time to review PSA—Although the PSA workshops were held over a 2-week period, the public and intervenors can provide comment to

the staff at anytime. Additionally, there will be opportunities for oral comment and input (as well as written comment) at the evidentiary hearings that will take place in the fall, 2000. This will provide you and the public additional time to review and analyze the project and provide comment.

ALESIA HABEEB

AH-1 Visual resources and compatibility with the neighborhood—The Energy Commission is responsible for completing an independent assessment of the power plant project and for determining whether there are any potential significant visual impacts and whether these impacts can be mitigated to less than significant. Visual appearance, compatibility with nearby neighborhoods and schools, public health and safety are just a few aspects of the plant that we carefully evaluate.

AH-2 Property values—see Socioeconomic Resources

TEWFIK MOURAD

TM-1 Air quality not adequately addressed—see Air Quality

TM-2 Noise and vibration—see Noise

TM-3 Impact to streams—see Biological Resources

DAPHNE RENELLE

DR-1 Health and other impacts—The Energy Commission is responsible for completing an independent evaluation of the power plant project (as proposed by the applicant) and for determining whether there are potential significant impacts and whether these impacts can be mitigated to less than significant levels. Public health effects, compatibility with nearby neighborhoods and schools, water quality, ground water contamination, and hazardous materials are just a few of the aspects and potential impacts that are closely reviewed by the Energy Commission. The Energy Commission has more than twenty years of experience in which about 90 power plant proposals have been analyzed. Regarding the location of the plant, the developer is responsible for selecting a site. Once the developer selects a site and files an Application for Certification with the Energy Commission, the Energy Commission staff will complete an independent assessment of the project and the site. The Energy Commission does not have the authority to require the developer to move the plant to another location such as the next valley to the east as you suggest.

DR-2 Transmission and plant location—see response DR-1 response above

NEED CONFORMANCE

Statement of Kerry Willis, Staff Counsel

The Metcalf Energy Center Application for Certification was accepted on November 30, 1999. Prior to January 1, 2000, the Public Resources Code prohibited the Energy Commission from certifying a power plant unless the Commission made a finding that the facility was found to be in conformance with the Commission's integrated assessment of the need for new resource additions. (Pub. Resources Code §§ 25523(f) and 25524(a).) The Public Resources Code directed the Commission to do an "integrated assessment of need," taking into account 5- and 12-year forecasts of electricity supply and demand, as well as various competing interests, and to adopt the assessment in a biennial electricity report.

On September 28, 1999, the Governor signed Senate Bill No. 110, which became Chapter 581, Statutes of 1999. This legislation repealed Public Resources Code sections 25523(f) and 25524(a) and amended other provisions relating to the assessment of need for new resources. It removed the requirement that the Commission make a specific finding that the proposed facility is in conformance with the adopted integrated assessment of need. Regarding need-determination, Senate Bill 110 states:

"Before the California electricity industry was restructured the regulated cost recovery framework for power plants justified requiring the commission to determine the need for new generation, and site only power plants for which need was established. Now that power plant owners are at risk to recover their investments, it is no longer appropriate to make this determination."

(Pub. Resources Code, § 25009, added by Stats. 1999, ch. 581, § 1.) Senate Bill 110 took effect on January 1, 2000 (Cal. Const. Art. 4, § 8.). As of January 1, 2000, the Commission is no longer required to determine if a proposed project conforms with an integrated assessment of need. As a result, an application for certification for which the Commission adopts a final decision after January 1, 2000 is not subject to a finding of "need-conformance."

In this case, the Commission's final decision will be made after January 1, 2000. Therefore, because of SB 110, the Commission will make no finding of "need-conformance" with respect to the proposed project.

AIR QUALITY

Testimony of Magdy Badr

INTRODUCTION

This analysis addresses the potential air quality impacts resulting from criteria air pollutant emissions created by the construction and operation of the Metcalf Energy Center project. Criteria air pollutants are those for which a state or federal standard has been established. They include nitrogen dioxide (NO₂), sulfur dioxide (SO₂), carbon monoxide (CO), ozone (O₃) and its precursors (nitrogen oxides (NO_x) and volatile organic compounds (VOC), and particulate matter less than 10 and 2.5 microns in diameter (PM₁₀ and PM_{2.5}) and their precursors: NO_x, VOC, and SO_x.

In carrying out its analysis, the California Energy Commission staff evaluates the following:

- whether the Metcalf Energy Center project is likely to conform with applicable Federal, State, and Bay Area Air Quality Management District (BAAQMD) air quality laws, regulations and standards, as required by Title 20, California Code of Regulations, sections 1744(b) and 1744.5 (b),
- whether the Metcalf Energy Center is likely to cause significant air quality impacts, including new violations of ambient air quality standards or contributions to existing violations of those standards, as required by Title 20, California Code of Regulations, sections 1742(b) and 1742.5 (b), and
- whether the mitigation proposed for the Metcalf Energy Center is adequate to lessen the potential impacts to a level of less than significant, as required by Title 20, California Code of Regulations, section 1742(b), and 1742.5(a).

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

FEDERAL

The federal Clean Air Act requires any new major stationary sources of air pollution and any major modifications to major stationary sources to obtain an air pollution permit before commencing construction. This process is known as New Source Review (NSR). Its requirements differ depending on the attainment status of the area where the major facility is to be located. Prevention of Significant Deterioration (PSD) requirements apply in areas that are in attainment of the national ambient air quality standards. The Non-attainment area NSR requirements apply to areas that have not been able to demonstrate compliance with national ambient air quality standards. The entire program, including both PSD and Non-attainment NSR permit reviews, is referred to as the federal NSR program.

Title V of the federal Clean Air Act requires states to implement and administer an operating permit program to ensure that large sources operate in compliance with

the requirements included in the Code of Federal Regulations 40, part 70. A Title V permit contains all of the requirements specified in different air quality regulations which affect an individual project.

The U.S. Environmental Protection Agency (EPA) has reviewed and approved the Bay Area Air Quality Management District's (BAAQMD) regulations and has delegated to the BAAQMD the implementation of the federal PSD, Non-attainment NSR, and Title V programs. The BAAQMD implements these programs through its own rules and regulations, which are, at a minimum, as stringent as the federal regulations.

STATE

The California State Health and Safety Code, Section 41700, requires that "no person shall discharge from any source whatsoever such quantities of air contaminants or other material which causes injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, response, health, or safety of any such person or the public, or which causes, or have a natural tendency to cause, injury or damage to business or property."

The state's Air Resources Board (ARB) promulgates state-level ambient air quality standards, which are, in general, more stringent than the national ambient air quality standards. Table 5.2-2 in the Application for Certification (AFC) presents a summary of the current national and state ambient air quality standards.

LOCAL

The proposed facility is subject to various BAAQMD rules and regulations. Regulation 2, Rule 2 is the more relevant local air quality rule for this project. This rule, entitled "New Source Review," applies to all new and modified stationary sources. It defines requirements related to Best Available Control Technology (BACT), offsets, emission calculation procedures to estimate bankable emission reduction credits (ERCs), and requirements for the federal acid rain program.

A more complete discussion of the applicable rules and regulations can be found in section 8.1, regulatory setting of the AFC and various air quality data responses. An in-depth discussion how the Metcalf Energy Center will comply with all applicable rules and regulations is provided in the BAAQMD's Final Determination of Compliance (FDOC).

SETTING

METEOROLOGY AND CLIMATE

A presentation of the meteorological and climatological characteristics of the region can be found in section 8.1 of the AFC. In addition, the BAAQMD has published an excellent discussion on this subject, entitled "Climate, Physiography, and Air Pollution Potential - Bay Area and its Subregions" (BAAQMD, 1999).

The Metcalf Energy Center, if approved, would be located in a climatological subregion of the Bay Area known as the Santa Clara Valley. It is located eleven miles southeast of downtown San Jose and approximately eight miles northwest of the town of Morgan Hill. The project site is relatively flat bounded by Santa Teresa Hills on the southwest and other ridges of the Coastal Range to the northeast.

The project area is characterized by prevailing winds predominantly from the northwest which are associated with the flow of the cool marine air inland to the warm interior during the warm part of the day and warm part of the year. These wind directions will provide favorable conditions for the dispersion of pollutants during the summer and fall seasons. However, during the cool parts of the year and sometimes during parts of the day, when temperatures over the Bay are warmer than inland, convective flow of southeasterly winds occur. These wind conditions will inhibit dispersal of low-lying sources of pollution which can result in increased concentrations of pollution during the winter and spring seasons. Calm conditions occur one percent of the time. Summer temperature ranges from average mid-50s to high 80s. In winter, the average lows are in the 40s and the average highs are in the 50s. These data are obtained from the meteorological monitoring station in south San Jose operated by IBM.

EXISTING AMBIENT AIR QUALITY

Both the EPA and the ARB have established National Ambient Air Quality Standards (NAAQS) and California Ambient Air Quality Standards (CAAQS) for the levels of all criteria pollutants which are designed to protect the most sensitive members of the population such as children, elderly and people with lung or heart diseases. AIR QUALITY Table 1 summarizes these standards. In general, when these NAAQS are exceeded more than once a year for one of the criteria pollutants, the area will be designated as nonattainment for that pollutant. For example, the Bay Area air quality basin is classified as nonattainment for ozone. Therefore, the BAAQMD will be obligated in their Air Quality Management Plan to require and enforce more stringent control requirements to reduce ozone in the air basin.

AIR QUALITY Table 2 summarizes the Ambient Air Quality Monitoring data recorded at the San Jose-4th Street monitoring station for ozone, PM10 NO2 and CO from 1993 to 1998. The table provides the concentration of each pollutant, the averaging time over which the concentration is measured and the number of days of the year which the CAAQS or NAAQS is violated. In 1998 the EPA reclassified the Bay Area as nonattainment for ozone based on violations of the federal standards at several locations in the air basin.

AIR QUALITY Table 1
Federal and State Ambient Air Quality Standards

Pollutant	Averaging Time	Federal Standard	California Standard
Ozone (O ₃)	1 Hour	0.12 ppm	0.9 ppm
	8 Hour	0.08 ppm	---
Carbon Monoxide (CO)	8 Hour	9.0 ppm	9 ppm (10 mg/m ³)
	1 Hour	35 ppm (40mg/m ³)	20 ppm (23 mg/m ³)
Nitrogen Dioxide (NO ₂)	Annual Average	0.053 ppm (100µg/m ³)	---
	1 Hour	---	0.25 ppm (470 µg/m ³)
Sulfur Dioxide (SO ₂)	Annual Average	80 µg/m ³ (0.03 ppm)	---
	24 Hour	365 µg/m ³ (0.14 ppm)	0.04 ppm (105 µg/m ³)
	3 Hour	1300 µg/m ³ (0.5 ppm)	---
	1 Hour	---	0.25 ppm (655µg/m ³)
Suspended Particulate Matter (PM 10)	Annual Geometric Mean	---	30 µg/m ³
	24 Hour	150 µg/m ³	50 µg/m ³
	Annual Arithmetic Mean	50 µg/m ³	---
Sulfates (SO ₄)	24 Hour	---	25 µg/m ³
Lead	30 Day Average	---	1.5µg/m ³
	Calendar Quarter	1.5µg/m ³	---
Hydrogen Sulfide (H ₂ S)	1 Hour	---	0.03 ppm (42µg/m ³)
Vinyl Chloride (chloroethene)	24 Hour	---	0.010 ppm(26 µg/m ³)
Visibility Reducing Particulates	1 Observation	---	In sufficient amount to produce an extinction co-efficient of 0.23 per kilometer due to particles when the relative humidity is less than 70 percent.

AIR QUALITY Table 2
San Jose - 4TH St Ambient Air Quality Monitoring Data

Pollutant		1993	1994	1995	1996	1997	1998	Most Restrictive Ambient Air Quality Standard
Ozone	Highest 1-hr	0.11	0.11	0.13	0.11	0.094	0.15	0.09(CAAQS) 0.12(NAAQS)
	# of days with violations of CAAQS	3	2	14	5	0	4	---
PM10	Highest 24-hr conc. ($\mu\text{g}/\text{m}^3$)	92	92.6	59.7	76.1	78	92	150(NAAQS)
	# of days with violations of CAAQS	8	7	4	2	3	3	---
	Highest annual conc. ($\mu\text{g}/\text{m}^3$)	NA	NA	21.91	22.08	23.73	22.48	30 (CAAQS)
NO₂	Highest 1-hr conc. (ppm)	0.12	0.107	0.116	0.108	0.108	0.083	0.25 (CAAQS)
	Highest Annual conc. ($\mu\text{g}/\text{m}^3$)	0.027	0.028	0.027	0.025	0.025	0.025	0.053 (CAAQS)
CO	Highest 1-hr conc. (ppm)	14	12	8.9	8.8	9.9	8.6	20.0 (CAAQS)
	Highest 8-hr conc. (ppm)	6.88	8.75	5.84	7	6.11	6.27	9.0 (CAAQS)
SO₂	Highest 1-hr conc. (ppm)	NA	NA	NA	NA	NA	NA	0.05 (CAAQS)
	Annual Avg. (ppm)	NA	NA	NA	NA	NA	NA	0.003

NA: Data are Not Available.

Source: CARB. 1993-1998 "Air Quality CD-ROM"

OZONE

In the presence of the ultraviolet radiation, both NO_x and VOC go through a number of complex chemical reactions to form ozone. AIR QUALITY Table 3 summarizes the best representative ambient air quality data collected from three different monitoring stations close to the project site. The table shows that, generally, the ozone formation is high in the summer time and low in the winter time. The San Francisco air basin is classified as a nonattainment area for ozone because it violates California Ambient Air Quality Standards (CAAQS) and recently, as discussed above, the National Ambient Air Quality Standards (NAAQS). The table also shows the maximum hourly concentration and the number of days above the State standards.

AIR QUALITY Table 3 Ozone Air Quality Summary, 1991-1996

Year	4 th Street			Piedmont Street			W San Carlos		
	Max. 1-hr Avg. (ppm)	Days Above State Stand.	Month Violations occurred	Max. 1-hr Avg. (ppm)	Days Above State Stand.	Month Violations occurred	Max 1-hr Avg. (ppm)	Days Above State Stand.	Month Violation occurred
1991	0.1	6	Jl,S,O	NA	NA	NA	0.08	0	0
1992	0.12	3	Jl,S	0.13	5	S,O	0.11	1	S
1993	0.11	3	Ju,Jl,S	0.11	5	Ju,Jl,Au,S	0.13	4	Ju,Jl,Au,S
1994	0.11	2	Ju,Au	0.12	3	Ju,Au,S	0.1098	1	Au
1995	0.13	14	Ju,Jl,Au	0.15	15	Ju,Jl,Au,S	0.047	0	0
1996	0.11	5	Ap,My,Ju,S 0.12	0.12	5	My,Ju,Jl	NA	NA	NA
1997	0.094	0	0	0.095	1	S	NA	NA	NA
1998	0.15	4	Jl,Au,S	0.13	5	Jl,Au,S	NA	NA	NA

California Ambient Air Quality Standard: 0.09 ppm

National Ambient Air Quality Standard: 0.12 ppm

Month abbreviations: J-January, F-February, M-March, Ap-April, My-May, Ju-June, Jl-July, Au-August, S-September, O-October, N-November, D-December

NA: Data are Not Available at this Station.

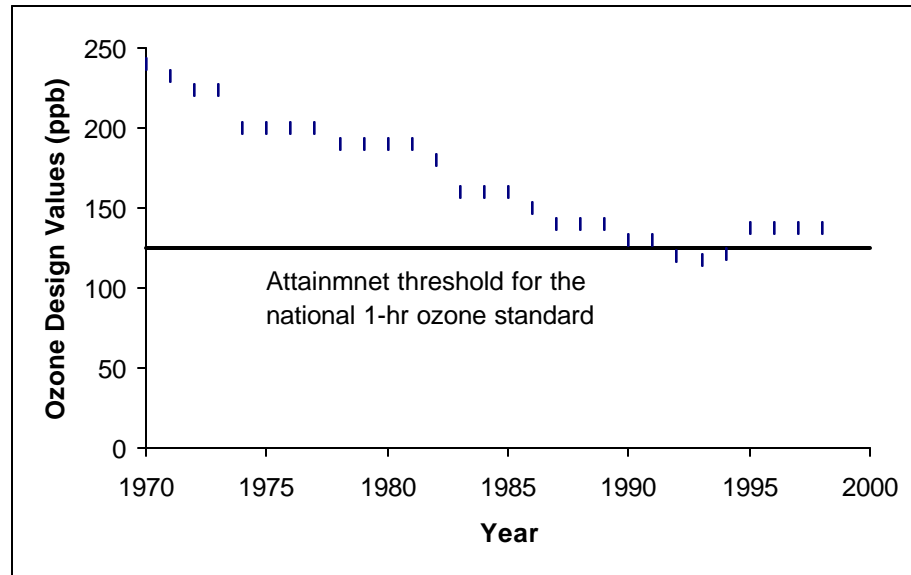
Source: CARB. 1991-1998 "Air Quality CD-ROM"

Ozone formation is influenced significantly by year-to-year changes in atmospheric conditions. For this reason, a long-term trend in ambient ozone levels is needed to understand if a region is experiencing reductions in its ambient ozone concentrations or not. As shown in AIR QUALITY Figure 1, the long-term statistics of ozone levels in the San Francisco Bay Area region shows that this region has made significant strides toward attainment of the previous federal ozone 1-hour standard. However, the Bay Area is still in violation of the State and Federal ozone standards.

The reasons for the recent violations of the federal ozone standard shown in the AIR QUALITY Figure 1 are not known. However, one important characteristic of the last few years is that more exceedences have been observed during weekends, when NO_x emissions are expected to go down by 30 percent, and VOC emissions would only be reduced by 10 percent from the emission levels expected during weekdays (SCAQMD 1997). The "weekend effect", modeling analyses, and other corroborative analyses suggest that the air basin may be VOC limited. That means by limiting the VOC emission in the air basin, the formation of ozone will be lower. The BAAQMD has conducted modeling analysis and confirmed the need of reducing VOC emission. This means that any reductions in NO_x emissions may be counterproductive unless accompanied by reductions in VOC emissions. The BAAQMD has developed its State Implementation Plan (SIP) in which it identified the strategy to bring the air basin back to attainment of the national 1-hour standard (BAAQMD Ozone Attainment Plan 1999). Additional studies will be conducted in the future to better understand the ozone problem in the Bay Area air basin and surrounding air basins. The study results will be used to develop equitable and

more effective air quality management strategies to reach attainment of federal air quality standards.

AIR QUALITY Figure 1
District Ozone Design Value 1970-1998



Each design value represents the fourth highest concentration recorded in the air basin during the previous three years. Design values are used to determine attainment status. Source: BAAQMD, 1998.

CARBON MONOXIDE (CO)

As AIR QUALITY Table 2 shows that the highest one hour and eight hours concentrations are significantly less than California Ambient Air Quality Standards. CO emissions is a local pollutant found near the source of emission with high concentrations. CO emissions is predominately generated as a result of the internal combustion process. Automobiles and mobile sources are the principal source of the CO emissions. CO emissions can also be generated from fireplaces and wood-burning stoves. Industrial sources contribute for less than 10 percent of the ambient CO levels in the Bay Area. There has been no violation of California Ambient Air Quality Standards or National Ambient Air Quality Standards since 1992 for the one hour or the eight hour standards in the San Jose area.

The highest concentrations of CO occur when low wind speeds and a stable atmosphere trap the pollution emitted at or near ground level in what is known as the stable boundary layer. These conditions occur frequently in the wintertime late in the afternoon, persist during the night and may extend one or two hours after sunrise. Since the mobile sector (cars, trucks, busses) is the main source of CO, we expect ambient concentrations of CO to be highly dependent on emissions from the mobile sector. In fact, the peak CO concentrations occur during the rush hour traffic in the morning and afternoon.

Carbon monoxide concentrations in San Jose and the rest of the state have declined significantly due to two state-wide programs: 1) the 1992 wintertime

oxygenated gasoline program, and 2) Phases I and II of the reformulated gasoline program. New vehicles with oxygen sensors and fuel injection systems have also contributed to the decline in CO levels in the state. Today, all the counties in California, with the sole exception of Los Angeles County, are in compliance with the CO ambient air quality standards.

NITROGEN DIOXIDE (NO₂)

As AIR QUALITY Table 2 shows that the highest one hour and annual concentrations in San Jose area are significantly less than California Ambient Air Quality Standards. Approximately 90 percent of the NO_x emitted from combustion sources is NO, while the balance is NO₂. NO is oxidized in the atmosphere to NO₂ but some level of photochemical activity is needed for this conversion. This is why the highest concentrations of NO₂ occur during the fall and not in the winter when atmospheric conditions favor the trapping of ground level releases but lack significant photochemical activity (less sun light). In the summer the conversion rates of NO to NO₂ are high but the relatively high temperatures and windy conditions (unstable atmospheric conditions) disperse pollutants, preventing the accumulation of NO₂ to levels approaching the 1-hour ambient air quality standard. The following equation shows the formation of NO₂ in the summer with the help of the ozone.



In urban areas, ozone concentration level is typically high. That level will drop substantially at night as the above reaction takes place between ozone and NO. This reaction explains why, in urban areas, ozone concentrations at ground level drop, while aloft and in rural areas (without sources of fresh NO_x emissions) ozone concentrations can remain relatively high.

PARTICULATE MATTER (PM)

As Table 4 indicates, the project area also annually experiences a number of violations of the state 24-hour PM₁₀ standard. The violations of the state 24-hour standard occur predominately between the months of August and February, with the highest number of violations occurring from October through February.

PM₁₀ can be emitted directly or it can be formed many miles downwind from emission sources when various precursor pollutants interact in the atmosphere. Gaseous emissions of pollutants like NO_x, SO_x and VOC from turbines, and ammonia from NO_x control equipment can, given the right meteorological conditions, form particulate matter known as nitrates (NO₃), sulfates (SO₄), and organics. These pollutants are known as secondary particulates, because they are not directly emitted but are formed through complex chemical reactions in the atmosphere.

AIR QUALITY Table 4
PM10 Air Quality Summary, 1991-1998
Maximum 24-hour Average Concentration (mg/m3)

Year	4 th Street			Moorpark			Piedont St.			Tully Road			W. San Carlos		
	Max 24-hr Avg. (ppm)	Days Above State Standard	Months Violations occurred	Max 24-hr State Standard	Days Above State Standard	Months Violations occurred	Max 24-hr State Standard	Days Above State Standard	Months Violations occurred	Max 24-hr State Standard	Days Above State Standard	Months Violations occurred	Max 24-hr State Standard	Days Above State Standard	Months Violations occurred
1991	153	26	J,F,O,N,D	120	13	J,O,N,D,	NA	NA	NA	111	11	J,O,N,D	111	14	J,O,N,D
1992	106	13	J,Au,S,O,N,D	104	8	J,N,D	NA	NA	NA	110	11	J,F,JI,O,N,D	112	9	J,Au,N,D
1993	92	8	J,M,N,D	76	3	N,D	NA	NA	NA	101	7	J,N,D	93	5	M,N,D
1994	92.6	7	J,F,D	66.6	4	J,F,D	NA	NA	NA	90.2	7	J,F,N,D	79.5	6	J,F,D
1995	59.7	4	F,O,N	54.5	1	O	57.4	1	O	48.6	0	0	45.8	0	0
1996	76.1	2	F,N	58.4	1	N	58.7	2	F,N	66.8	1	N	NA	NA	NA
1997	78	3		60.7	3	J,D	55.3	1	J	95	3	J,D	NA	NA	NA
1998	92	3	Ap,O,D	42.5	0	0	54.4	1	Ap	88.5	1	D	NA	NA	NA

California Ambient Air Quality Standard: 50 µg/m³ (24-hour average)

National Ambient Air Quality Standard: 150 µg/m³ (24-hour average)

Month abbreviations: J-January, F-February, M-March, Ap-April, My-May, Ju-June, JI-July, Au-August, S-September, O-October, N-November, D-December

NA: Data are Not Available at this Station.

Source: CARB. 1991-1998 "Air Quality CD-Rom"

PM nitrate (mainly ammonium nitrate) is formed in the atmosphere from the reaction of nitric acid and ammonia. Nitric acid in turn originates from NO_x emissions from combustion sources. The nitrate ion concentrations during the winter time are a significant portion of the total PM₁₀ and should be even a higher contributor to particulate matter of less than 2.5 microns (PM_{2.5}). The nitrate ion is only a portion of the PM nitrate, which can be in the form of ammonium nitrate (ammonium plus nitrate ions) and some as sodium nitrate.

The highest PM concentrations are measured in the winter. During wintertime high PM episodes, the contribution of ground level releases to ambient PM concentrations is disproportionately high. For example, wood smoke contributes approximately 47 percent of the PM₁₀ mass in San Jose, while the contribution at Pittsburg may be on the order of 30 percent (Chow et al. 1995).

ACID RAIN

The Metcalf Energy Center gas turbine units and heat recovery steam generators will be subject to the requirements of Title IV of the federal Clean Air Act. The requirements of the Acid Rain Program are outlined in 40 CFR Part 72. The specifications for the type and operation of continuous emission monitors (CEMs) for pollutants that contribute to the formation of acid rain are given in 40 CFR Part 75. District Regulation 2, Rule 7 incorporates by reference the provisions of 40 CFR Part 72. Pursuant to 40 CFR Part 72.30(b)(2)(ii), MEC must submit an Acid Rain Permit Application to the District at least 24 months prior to the date on which each unit commences operation. Pursuant to 40 CFR Part 72.2, "commence operation" includes the start-up of the unit's combustion chamber.

OTHER AIR POLLUTANTS

There are also ambient air quality standards for sulfates and lead. A full description of the measured ambient air concentrations in San Jose area is contained in section 8.1.3.5 and 8.1.3.7 of the AFC. The ambient concentrations of these pollutants are well below their respective standards.

METCALF ENERGY CENTER ESTIMATED EMISSIONS

CONSTRUCTION PHASE

The construction phase includes the power plant and ancillary facilities (i.e., transmission lines, and pipelines for reclaimed water, natural gas, fire and potable water). The construction of the proposed power plant will result in temporary emissions for approximately 20 months. All construction scheduling is based on a 40-hour per week. The activities during the main phase of construction will include site preparation including cleaning, grading and excavation for the foundation. After the site preparation is completed, the construction of the foundations will follow. Installations and assembly of mechanical equipment will begin soon after the foundation work is completed.

Fugitive dust will be emitted primarily during the site preparation, grading and excavation, travelling on the unpaved surfaces and during the loading and unloading of soil from/to the site. Criteria pollutants also will be emitted during the construction of project from combustion emissions. These emissions are primarily exhaust from the diesel construction equipment used in all phases of the site preparation, exhaust from water trucks, welding equipment, workers vehicles, delivery trucks, generators and compressors.

Table 8.1E-1 and its attachments in the AFC presents detailed construction emission estimates for fugitive dust, PM₁₀, NO_x, CO, SO_x, and VOC emissions from vehicles. Construction emissions are unavoidable but can be mitigated to less than significant level. It is important to understand that construction estimated emissions are highly speculative since detailed activity data can not be forecast accurately and the emission factors used in these estimations are known to be worst case estimates.

COMMISSIONING AND OPERATIONAL PHASES

"Commissioning" is the technical term used to describe, in general, all the initial operations of the power plant once it has been physically installed but is not yet in commercial operation. Commissioning starts with the first firing of fuel in the GT/HRSG or in the auxiliary boilers. During commissioning the control systems are tested, the burners are tuned up, the inside and outside of tubes are cleaned up, and the control systems are installed after determining that there are no contaminants in the GT/HRSG that may damage the surfaces of the catalysts. During the commissioning period, which can last for several months, the power plant will operate without emission controls. Commissioning ends with the start of commercial operation, which is usually signaled by the issuance of the Permit to Operate (PTO) from the local air district.

The proposed Metcalf Energy Center is a combined cycle power plant with two new power trains. Each power train consists of a Westinghouse 501F gas turbine rated at 200 MW, a duct burner and a heat recovery steam generator (GT/HRSG). The steam from the heat recovery steam generators will be fed to a steam turbine rated at 234 MW. The actual operation of turbines will range between 70 percent to 100 percent of their maximum rated output. Supplemental firing, which is limited to 1500 hours/year, will be provided by the duct burners up to 200 MMBtu/hr to maintain required electricity and steam production rates. The facility will also include 10-cell mechanical cooling tower which will operate 8760 hours/year, a 600 kW emergency generator operating at a maximum of 200 hours/year and a 300 hp Diesel fire pump engine which will operate at a maximum of 100 hours/year. AIR QUALITY Table 5 summarizes the hourly, daily and annual air emissions associated with the operation of the Metcalf facility and the assumptions are used to calculate the daily and annual emissions. AIR QUALITY Table 5, there are two levels of annual emissions. The high emission level is associated with the first year of operation which includes the commissioning period of the facility, when the annual level is projected to be higher. The Applicant is providing mitigation for these levels. However, after the first year and during the rest of the life time of the facility, the Applicant is willing to accept much lower levels of annual operating emissions as

shown in AIR QUALITY Table 5, holding the operating assumptions of the facility the same.

The Metcalf Energy Center will burn only natural gas, with no provisions for an alternative backup fuel. The exclusive use of natural gas, an inherently clean fuel compared to oil or coal, will limit the formation of VOC, PM10, and SOx emissions. The combustion turbines will be equipped with low-NOx combustors to minimize NOx formation. After combustion, the turbine exhaust gasses will be treated by Selective Catalytic Reduction (SCR) systems to further reduce NOx emissions. Continuous emissions monitoring systems (CEMs) will be required and installed to closely monitor the project's emission levels. Calpine/Bechtel is not proposing to use post-combustion oxidizing catalyst at this time to further control CO and VOC emissions. AIR QUALITY Table 6 summarizes the maximum facility heat input rates (natural gas use) in MMBtu.

AIR QUALITY Table 5
Maximum Hourly, Daily, and Annual Emissions

	NO ^x	CO	VOC	PM10	SO ^x
GT1 (lb/hr)	17.97	43.84	5.0	9.0	1.2
GT2 (lb/hr)	1797	43.84	5.0	9.0	1.2
GT1 w/DB (lb/hr)	19.21	46.8	5.4	11.0	1.28
GT2 2/DB (lb/hr)	19.21	46.8	5.4	11.0	1.28
Cooling Tower (lb/hr)	-	-	-	1.81	-
GT-S (lb/hr)	80	838	16.0	10.0	
EG (lb/hr)	1.77	3.02	1.42	0.28	0.004
FPE (lb/hr)	3.9	2.35	0.48	0.17	0.106
Total Facility Daily Emissions (lb/day)^a					
	1366.4	8,595.7	332.2	571.4	57.9
1st Year Total Facility Annual Emissions (Ton/year)^b					
	185.6	736.0	49.2	91.3	10.6
Total Annual Emissions After The 1st Year (Ton/year)^c					
	123.4	588	28	91.3	10.6
GT1 =the first gas turbine. GT1 w/DB = the first gas turbine and Duct Burner. GT-S = Start up emissions from either GT. EG = Emergency Generator FPE = Fire Pump Engine a) Based on one cold start up and one hot start up, 16 hours of full load operation with Duct burner, 4 hours at full load operation without duct burners and 24 hours of cooling towers operation. b) Based on 6844 hours pf full load operation for each turbine, 1500 hours of duct burner firing, 156 one-hour hot start-up for each turbine per year, 52 three-hour cold start-ups per each turbine per year. c) Same assumption as (b) without the commissioning emissions.					

Source: AFC, Supplement C, dated Feb. 15, 2000.

The following AIR QUALITY Table 6 delineates the maximum heat rate in million Btu (MMBtu) assumptions underlying the emission calculations for the new equipment for the Metcalf Energy Center shown in the above table.

AIR QUALITY Table 6
Maximum Hourly, Daily, and Annual Fuel Consumption

	Hourly (MMBtu/hr)	Daily (MMBtu/day)	Annual (MMBtu/year)
GT1	1990.5	15,924	14,451,030
GT2	1990.5	15,924	14,451,030
GT1 + DB	2124	33,984	3,186,000
GT2 + DB	2124	33,984	3,186,000
Total Facility	4277	100,522	35,332,860

Source: AFC Table 8.1-15

PROJECT IMPACTS

The air quality impacts of project operation are shown in the following sections for fumigation meteorological conditions, and during combustion turbine start-up and steady-state operations.

FUMIGATION IMPACTS

During the early morning hours before sunrise, the air is usually very stable. During such stable meteorological conditions, emissions from elevated stacks rise through this stable layer and are dispersed. When the sun first rises, the air at ground level is heated, resulting in a vertical (both rising and sinking air) mixing of air for a few hundred feet or so. Emissions from a stack that enter this vertically mixed layer of air will also be vertically mixed, bringing some of those emissions down to ground level. Later in the day, as the sun continues to heat the ground, this vertical mixing layer becomes higher and higher, and the emissions plume becomes better dispersed. The early morning air pollution event, called fumigation, usually lasts approximately 30 to 90 minutes.

The applicant used the SCREEN3 model, which is an EPA approved model, for the calculation of fumigation impacts. AIR QUALITY Table 7 shows the modeled fumigation results and impacts on the 1-hour NO₂, CO, and SO₂ standards. Since fumigation impacts will not typically occur much beyond a 1-hour period, only impacts on these 1-hour standards are addressed. The results of the modeling analyses show that fumigation impacts at either partial load or full load will not violate the NO₂, CO or SO₂ 1-hour standards.

AIR QUALITY Table 7
CTG Fumigation Modeling Maximum 1-Hour Impacts

Pollutant	Averaging Time	Fumigation Impact (mg/m³)	Start-up Impact (mg/m³)	Background (mg/m³)	Limiting Standard (mg/m³)
NO ₂	1-hour	13.0	81.4	226	470
CO	1-hour	45.6	1942.8	11500	23000
SO ₂	1-hour	0.63	2.8	107	650
PM ₁₀	24-hour	3.2	-	95	50

SECONDARY POLLUTANT IMPACTS

The project's gaseous emissions, primarily NO_x, SO₂ and VOC, can contribute to the formation of secondary pollutants, namely ozone and PM₁₀, particularly ammonium nitrate, PM₁₀ and sulfate. There are air dispersion models that can be used to quantify ozone impacts, but they are used for regional planning efforts where hundreds or even thousands of sources are input into the modeling to determine ozone impacts. There are no regulatory agency models approved for assessing single source ozone impacts. However, because of the known relationship of NO_x and VOC emissions to ozone formation, it can be said that the emissions of NO_x and VOC from the MEC do have the potential (if left unmitigated) to contribute in some unquantified way to higher ozone levels in the region.

Staff believes that the emissions of NO_x from MEC have the potential (if left unmitigated) to contribute, to higher secondary PM₁₀ (particularly of ammonium nitrate) levels in the region. Secondary formation of PM₁₀ can be limited by reducing the ammonia slip, by reducing NO_x emissions from the project, and fully mitigating the project's emissions liabilities. The Applicant has agreed to reduce the ammonia slip to 50%, the NO_x emissions by a 33% by installing a larger SCR that provides the catalyst with more time and surface area to normalize NO_x emission, and fully mitigate the project liabilities from the local area (San Jose and Mountainview area) to all emissions. With the above mitigation of reductions and offsets, the impact on air quality of secondary emissions is less than significant.

MODELING APPROACH

Calpine/Bechtel used the SCREEN model to select the worst case turbine configuration that would produce the highest emission impacts. The SCREEN model, which is approved by EPA, is designed to provide conservative estimates of emission impacts. Based on the results of the SCREEN model, Calpine/Bechtel modeled the Westinghouse gas turbines and HRSGs configuration, including the duct burners, using a more refined modeling analysis. This more refined modeling analysis was done with the EPA approved Industrial Source Complex (ISC) model, and used near-by meteorological data collected at the IBM station in 1993.

SITE REPRESENTATION

EPA defines the term "on-site data" as data that would be representative of atmospheric dispersion conditions at the source and locations where the source

may have a significant impact on air quality. The requirement of the meteorological data originates in the Clean Air Act at section 165(e)(1). It necessitates an analysis of the ambient air quality at the proposed site and in areas which may be affected by emissions from such facility for each pollutant subject to regulation under the Act which will be emitted from the facility. For the meteorological data to be considered satisfactory to represent the project area depending on: a) the proximity of the monitoring site to the project area; b) the complexity of the topography of the area; c) the exposure of meteorological sensors; and d) the period of time during which the data are collected.

In determining the representativeness of the IBM meteorological data set for use at the project site, the following considerations were addressed:

- *Aspect ratio of terrain, which is the ratio of the height of the isolated hill to the width of the hill at its base* - The maximum height of Tulare Hill is approximately 325 feet above its base while the width of the hill at its base is 3200 feet. This is not a large terrain feature. Localized upslope and downslope wind fields would not be expected on such a small, isolated hill. Any larger scale upslope/downslope flow from the larger terrain features surrounding the project site would be identified on the IBM meteorological data set and would be representative of the Metcalf project site.
- *Slope of terrain* - Tulare Hill slope and its extension northwest of the project site are not significant. The surface roughness of the hill and its extension are small, as no objects such as trees, buildings, or steep terrain angles exist.
- *Ratio of terrain height to stack/plume height* - The terrain height of Tulare Hill rises approximately 315 feet above the project site elevation (stack base) towards the west, its highest point. The terrain extends approximately 110 feet above stack base towards the northwest. Final plume height (stack height plus plume rise) was calculated for D stability, 5 meter/second wind speed at 656 feet (estimated 139 foot stack height, 517 foot plume rise) above the stack base. At this final height, terrain effects on plume dispersion would be non-existent, and the plume would disperse in an identical manner to the dispersion conditions monitored at the IBM site.
- *Correlation of terrain feature to prevailing meteorological conditions* - The orientation of Tulare Hill is identical to the orientation of all surrounding terrain (i.e., northwest to southeast) and correlates well with the prevailing wind field in the Santa Clara Valley. Thus, wind flow at the IBM site would be similar to that at the project site. A small projection of the hill rises to the northwest of the project site, but only to a height of approximately 110 feet above the site elevation. This hill extension, like the larger terrain feature, contains no trees or obstacles that would distort the local wind field.

As a result, Tulare Hill would have no effect on the meteorology at the project site on either a local or regional scale. The surface roughness height and length of Tulare Hill is expected to have very little effect on the horizontal and vertical wind

patterns. The slope and aspect of the terrain in the vicinity of the site would not appreciably affect the wind direction or speed. The final plume height from the proposed project will be above the highest terrain point for most meteorological conditions. IBM monitoring station is the closest station to the proposed site, at approximately 3 miles northwest of the site and its data was chosen to best represent the project site. All meteorological data reported at IBM site represents the proposed project site taking in consideration the Tulare Hill height and the slope of the terrain.

CONSTRUCTION IMPACTS

Calpine/Bechtel estimated the impacts of construction-related emissions using the ISC model. AIR QUALITY Table 8 provides a summary of the maximum estimated impacts. The modeling results indicate that the construction-related emissions under worst conditions would cause violations of the one hour NO₂ standard and 24 hour and annual PM₁₀ standards. It is also important to note that these are temporary impacts that would only occur during the construction phase of the project, and they reflect the implementation of some construction related mitigation measures which will be included in the conditions of certification proposed by Energy Commission staff to minimize emissions.

The results of this modeling effort are shown in AIR QUALITY Table 8. They show that the construction activities would cause a violation of the state 1-hour and annual average NO₂ standards and further exacerbate existing violations of the state 24-hour and annual average PM₁₀ standards. In reviewing the modeling output files, the project's construction impacts are not occasional or isolated events, but are over an area within a few hundred meters of the project site. These predicted impacts are of such a high magnitude for a number of reasons.

AIR QUALITY Table 8
Maximum Estimated Construction-Related Incremental Impacts

Pollutant	Averaging Time	Incremental Impacts (µg/m ³)	Maximum Background (µg/m ³) ¹	Maximum Total Impacts (µg/m ³)	State Limiting Standard (µg/m ³)	Federal Limiting Standard (µg/m ³)	Percent Of Standard (%)
No ₂ ²	1-hour	353	245	598	470		127.2
	Annual	34	51	85	-	100	85
PM ₁₀	24-hour	157	114.4	271.4	50	150	543
	Annual	28.6	25.9	54.5	30	-	181.6
CO	1-hour	616	11,500	12,116	23,000	40,000	52.7
	8-hour	607	8,167	8,716	10,000	10,000	87.2
SO ₂	1-hour	66	107	173	650	-	26.6
	24-hour	7.6	24	32	109	365	29
	Annual	1.3	0	1.3	-	80	1.6

¹Based on maximum daily emissions during month 15 of construction period.

² Ozone limiting method applied to the 1-hour average using the maximum background O₃ and NO₂ levels in the last three years.

Sources: AFC Table 8.1E-4 from AFC and from the FDOC.

First, some of the sources of combustion emissions (the bulldozers and trucks) are mobile sources, not stationary sources as input into the model. Therefore, as mobile sources, the air quality impacts would not always be at the same locations, so the model results are overstated. Second, it was assumed that all the equipment identified for the modeling evaluation would be running simultaneously. It is doubtful that all the major equipment, 4 large bulldozers, 4 backhoes, 12 cranes and 5 large flatbed trucks would all be operating at one time, and thus the impacts are overstated.

Finally, the emissions inputs to the model were from the highest monthly emissions assumed during the 20 months construction period. The levels of emissions used reflect a period of activity of approximately one year, not the entire 20 months construction. During the other months of construction work, considerably less emissions generating equipment will be used and thus the impacts will be lower.

As discussed in the AFC for the Metcalf Energy Project (AFC Section 8.1E.4.3), for construction modeling impacts, the one-hour NO₂ impacts were computed using the ozone limiting method and the annual NO₂ impacts were calculated using the ambient ratio method.

The analysis assumes that all the NO_x emitted from the vehicles is in the form of NO₂. In reality, approximately 90 percent of NO_x emissions from a combustion source are in the form of nitrogen oxide (NO), and eventually that NO would oxidize to NO₂. However, the NO₂ impact shown in the modeling analysis reflects the possible NO₂ impacts because Calpine/Bechtel took in consideration that only 10 percent of the NO_x is NO₂ (ozone limiting method).

In addition, the maximum fugitive dust PM₁₀ emission levels and impacts would not occur during the winter time, when the highest measured PM concentrations are historically measured in the Bay Area air basin. This is due to the fact that the ground tends to be wet during the winter because of the rains, and the relative humidity is high, which reduces the likelihood and amount of fugitive dust formation.

The Applicant is proposing a number of mitigation measures to control the exhaust emissions from the Diesel heavy equipment and to control fugitive dust emissions during the construction phase of the project. The measures such as installing sandbags to prevent silt runoff to roadways, covering all trucks hauling any loose material, using chemical dust suppressant to control dust and other measures are summarized in Section 8.1E.2 of the AFC. In addition to the Applicant proposed mitigation measures, Staff is proposing conditions of certification number 48, 49, 50, 52 to ensure that all construction emissions are fully mitigate. With the implementation of the Staff's mitigation measures and the temporary nature of these emission, Staff concludes that the impact of the construction emissions is less than significant.

PROJECT OPERATIONAL IMPACTS

Calpine/Bechtel has assessed the impact of the operation of the facility using EPA-approved air quality dispersion models and guidelines without considering the

offsets that will be provided. Staff, CARB and BAAQMD find the Calpine/Bechtel analysis of the operational impact to be acceptable. The AFC presents the SCREEN and the ISC modeling analyses in Appendix 8.1B and supplement C. The impact analyses were used to determine the worst case ground level impacts of the facility. The results show that the facility, by itself, does not violate the State or Federal ambient air quality standards for all pollutants.

However, the PM10 impact from the facility, when added to the existing background levels already above the State 24-hour standard, could on occasion contribute to further violations of that standard. The applicant will mitigate the project's PM10 impact by providing emission offsets as discussed in the mitigation section below, including specifics of the mitigation package, quantities and location of the ERC sources, and type of mitigation. AIR QUALITY Table 9 presents a summary of the ISC modeling results for the proposed Metcalf Energy Center. Though not required by BAAQMD regulations, the Applicant has agreed to proposed conditions of certification requiring it to provide offsets of regional PM10 emissions. If these offsets are provided as proposed by staff, the operational impacts of Pm10 emissions will be less than significant. Furthermore, as discussed before, the project will emit ozone precursors such as NOx and VOC emissions. These emissions are mitigated not only by very stringent emission controls, but are also offset by the purchased reduction of other regional pollution sources. With such mitigation, the impact on ozone in the region is less than significant.

**AIR QUALITY Table 9
ISC Modeling Results**

Pollutant	Averaging Time	Facility Maximum Impact ($\mu\text{g}/\text{m}^3$)	Maximum Background ($\mu\text{g}/\text{m}^3$)	Maximum Total Impacts ($\mu\text{g}/\text{m}^3$)	State Limiting Standard ($\mu\text{g}/\text{m}^3$)	Federal Limiting Standard ($\mu\text{g}/\text{m}^3$)	Percent of Standard (%)
NO ₂	1-hour	188	245	433	470		92.1
	Annual	0.67	51	51.7	-	100	51.7
CO	1-hour	650.3	11500	12150	23000	40000	53
	8-hour	549	8167	8716	10000	10000	87.1
PM10	24-hour	9.3	114.4	123.7	50	150	247.4
	Annual	1.1	25.9	27.0	30	-	90
SO ₂	1-hour	33.4	107	140.4	650	-	21.6
	24-hour	0.6	24	24.6	109	365	22.6
	Annual	0.06	0	0.1	-	80	0

Source: AFC Table3.1-9, Supplement C.

CUMULATIVE IMPACTS

In analyzing the cumulative potential impact, staff has identified the following projects to be modeled with Metcalf Energy facility: a) the full build-out of the Coyote Valley Research Park (CVRP) to around 20,000 employees, and b) the proposed Coyote Urban Reserve development (CURD) of up to 25,000 dwellings on the 170 acres. The ISC dispersion model was used to evaluate the ambient impacts of the three projects using the same meteorological data collected from the IBM facility during 1993. Emissions from on site vehicles and stationary sources (IC diesel engines used as emergency units) at CVRP, mobile emissions from CURD,

emissions from Highway 101 vehicles, and were modeled to calculate the cumulative impact. Summary of the results are summarized in AIR QUALITY Table 10. As the Table shows, the one hour NO₂ emissions maximum impact, and the 24 hours and annual PM₁₀ maximum impacts exceed the limiting standards. The Table shows also that the ambient PM₁₀ background is much higher than the limiting standards.

AIR QUALITY Table 10
Maximum Cumulative Impacts

Pollutant	Averaging Time	Impact (µg/m ³)	Background (µg/m ³)	Total Impact (µg/m ³)	Limiting Standard (µg/m ³)	Percent of Standard (%)
NO ₂	1-hour	277.8	245	522.8	470	111.2
	Annual	25.5	51	76.5	100	76.5
CO	1-hour	2268.9	11500	13768.9	23,000	60
	8-hour	1108	8167	9275	10,000	92.75
PM ₁₀	24-hour	67.7	114.4	182.1	50	364.2
	Annual	25	25.9	50.9	30	169.7

Data Response submittal April 28, 2000

As shown in Table 10, if CVRP or URD are permitted and developed as planned, the overall cumulative impact with MEC may contribute to exceedances of the state standards for NO₂ and PM₁₀. However, unlike CVRP and URD, the MEC project has provided complete offsets that equal or exceed its contribution to any potential air quality exceedance. This offset mitigation has been previously discussed in this analysis and is set forth in the air district's FDOC. Having provided its "fair share" of the mitigation to avoid a cumulative impact, the Commission may conclude that the impact of MEC is "less than cumulatively considerable", and thus not significant. (Cal. Code Regs., tit. 14, Sec. 15130(a)(3).)

MITIGATION

APPLICANT'S PROPOSED MITIGATION

Calpine/Bechtel is proposing to mitigate the project's potential air quality impacts using a state of the art combustion technology, installing post-combustion control devices, and providing offsets, as required by the BAAQMD's regulations. Calpine/Bechtel is proposing to install a gas turbine equipped with Low NO_x combustors that can achieve low NO_x concentrations. The GT/HRSG will be equipped with SCR to control NO_x to 2.5 ppm without the need for steam or water injection. However, Calpine/Bechtel is not proposing to install a CO catalyst to reduce CO emissions because they are proposing to meet the District's 6 ppm BACT limit.

ADEQUACY OF PROPOSED MITIGATION

BACT is the emission limitation applicable to individual projects that are typically determined by the local air district with input from the California Air Resources Board (CARB) and EPA. Recently, in both the High Desert, Sutter Power Plant

AFC cases and EPA letter to all air quality districts dated March 24, 2000, the EPA has clearly stated their position regarding what they consider to be BACT and Lowest Achievable Emission Rates (LAER). The EPA believes that BACT/LAER analyses for combined cycle gas turbine power plant projects must include consideration of technologies such as SCONOX and XONON to achieve lower NOx and CO limits without the use of ammonia or oxidation catalyst. Furthermore, EPA believes that top-down analysis is required for all projects. The BAAQMD has performed these analysis in the FDOC, dated August 21, 2000.

CONTROL OF NOX EMISSIONS

The project's NOx emissions consist primarily of nitric oxide (NO) and a small percentage of nitrogen dioxide (NO2). Thermal NOx is the product of the oxidation of N2 (present in the air used for combustion) at the temperatures present in the combustion process. Some NOx is formed from the oxidation of nitrogen present in the fuel. Nitrogen is not present in significant quantities in natural gas, so most of the NOx emissions from this project are due to thermal NOx.

Combustion chamber NOx can be controlled by reducing the flame temperature in the combustion chamber through quenching steam and dilution using water and steam injection. Additionally, thermal NOx can be controlled with combustor designs that premix the air and fuel and stage the combustion process (a reducing atmosphere followed by an oxidizing atmosphere). NOx emissions from the Metcalf Energy Center will be controlled through the use of dry low NOx combustors in the CTGs and the use of SCR as a post-combustion emission control. The turbines will be equipped with a number of dry low-NOx combustors to ensure optimal uniform temperature distribution in the primary air zone. A reduction in NOx emissions is also achieved by raising the mean air/fuel ratio. The use of dry low-NOx burners produces emissions as low as 25 ppm when natural gas is burned before entering the SCR.

In addition, Calpine/Bechtel's proposed SCR system will control NOx emission levels to 2.5 ppm corrected @ 15 percent O2. SCR is a process that chemically reduces NOx by injecting ammonia (NH3) over a catalyst in the presence of oxygen (O2). The process is termed selective because the NH3 reducing agent preferentially reacts with NOx rather than O2 to form N2 in the presence of excess O2 at temperatures in the range of 400 to 750 oF. If the temperature is lower than 400oF, the ammonia reaction rate is low, and therefore, NH3 emissions (called ammonia slip) will increase.

CONTROL OF CARBON MONOXIDE (CO) AND VOLATILE ORGANIC COMPOUNDS (VOC)

Good operating and maintenance practices are the only measures proposed for this project to limit the project's CO and reduce VOC emissions. Combustion turbines inherently generate low CO and VOC emissions when burning natural gas. However, while high combustion temperatures, fuel/air mixing, and the excess air inherent in the CTG's combustion process favor complete combustion of fossil fuels, these conditions, also lead to higher NOx emissions. Current CTG designs attempt to balance achieving low NOx emissions (from the CTG prior to post-combustion

controls) while keeping CO and VOC emissions low. In all power plants recently licensed by the California Energy Commission, except for Delta Energy Center and Moss Landing, oxidation catalysts have been proposed to control CO emission and reduce VOC emission levels.

BAAQMD's BACT determination guidelines for VOC, copy is provided in Appendix B, identify an "oxidation catalyst" as the "typical technology" used to minimize emissions, with 50% reduction by weight in VOC emissions. However, no specific emission concentration limit (e.g. ppm) is specified. Alternatively, Calpine/Bechtel proposed to meet a 1 ppm concentration level or equivalent in mass emissions during all scenarios of operation of the project without installing an oxidation catalyst. The BAAQMD has agreed in the past, in Delta Energy Facility, to the 2 ppm concentration level during all scenarios of operation of the project and has specified limitations in terms of mass emissions (lb/hr, lb/day, and tons per year) in the conditions of certification. The 1 ppm concentration limit is less than what is required by the CARB siting guidelines published in June 1999, titled "Guidance for Power Plant Siting and Best Available Control Technology".

With respect to CO, Calpine/Bechtel is not proposing to install a CO catalyst. They propose to meet a limit of 6 ppm over a three hour averaging time during all operating scenarios or equivalent in mass emissions. They claim that the CO catalyst would increase the project PM10 emissions by approximately 2 lb/hour. Calpine/Bechtel submitted an analysis to support their argument on May 7, 1999. The Applicant has accepted a condition of certification that was imposed by the District on this project to install an oxidation catalyst if the Applicant can not meet the above limits.

CONTROL OF PM10

Natural gas fuel contains only trace quantities of noncombustible material. Particulate emissions (PM10) will be controlled by inlet air filtering for the combined cycle CTG and HRSG unit. In addition, Calpine/Bechtel proposes to use a cooling tower which includes 0.0005% drift eliminator efficiency to reduce PM10 emissions associated with its operation. This is the best control technology available for this purpose and is therefore viewed as acceptable.

SULFUR DIOXIDE EMISSIONS CONTROL

The Metcalf Energy Center SO₂ emissions will be controlled by burning only natural gas, which typically contains only traces of sulfur. The emissions from the project's CTGs are expected to be very small without the use of any additional post-combustion SO₂ control equipment. Since natural gas contains only 2000 grains of sulfur per million cubic feet, the resulting SO₂ emission concentrations should be less than 4.0 ppm @15% O₂.

EMISSION OFFSETS

Emission reduction credits (ERCs) can be created when existing permitted emission sources cease operation or reduce their operation below permitted levels. The ERCs are reviewed and approved by the local air district and recorded in their "bank" for future use. To fully mitigate the facility's potential emission increases,

Calpine/Bechtel plans to purchase emission reduction credits (ERCs) from the BAAQMD ERC bank. All the provided offsets are located in San Jose and Mountainview areas.

Offsets, in the form of ERCs, are required for NO_x and VOCs in order to assure that the project will not interfere with BAAQMD's future "attainment" of the standards for ozone. BAAQMD will not require PM₁₀ offsets for this project because the PM₁₀ project emissions are less than the BAAQMD offset threshold of 100 tons per year. However, the Commission staff is requiring mitigation (offsets) of the project emissions of 91.3 tons per year to reduce air quality impacts to less than significant levels. PM₁₀ emissions for the project were originally projected on a worst-case basis to be 98.6 tons per year, but the applicant has subsequently provided information that this number will in fact be no more than 91.3 tons per year, as reflected in the proposed conditions for certification. This reduced level is based on nine pounds per hour of PM₁₀ from the CTG when operating at full load rather than ten pounds.

In past siting cases, some intervenors have argued that the ERCs are not actual mitigation since the emission reductions have already occurred and, therefore, ambient air quality can only deteriorate with the new source of emissions. However, the BAAQMD, in its Air Quality Management Plan (AQMP), includes banked ERCs in its planning emissions inventories for future years as actual ongoing emissions (BAAQMD, 1997b). Therefore, the future effects of new sources due to emission increases are already taken into account in the AQMP, including the use of ERCs as a source of mitigation or offsets. The new source will not detract from the BAAQMD's attainment strategy. Consequently, we believe that banked offsets in this case constitute real mitigation of potential impacts from the proposed project in the context of the BAAQMD's overall attainment strategy. The following AIR QUALITY Table 11 shows the amounts of ERCs that are provided, sources of the ERCs and ratio of mitigation.

AIR QUALITY Table 11 shows that the Applicant has secured 356 tons per year of VOC, 46.47 tons per year of NO_x and 29.21 tons per year of PM₁₀. According to Regulation 2-2-302 of the BAAQMD, the project's VOC liability will be mitigated at 1:1 ratio. That means the Applicant must provide 28 tons per year of offsets to a fully mitigate the VOC liability of the project. Pursuant to Regulation 2-2-302.2 of the BAAQMD, the MEC NO_x liability should be mitigated at a ratio of 1.15:1.0. The MEC' NO_x liability is 185 tons per year for the first year including emissions during the commissioning. The applicant is providing a total of 212.75 tons per year which includes 46.47 tons/year of NO_x emissions and 166.28 tons/year of VOC emissions to fully mitigate the MEC NO_x emissions.

To eliminate the potential for a significant adverse impact under CEQA, staff recommends the Applicant fully mitigate the MEC's PM₁₀ emissions of 91.3 tons per year including cooling tower emissions. The Applicant is providing 29.2 tons per year of direct PM₁₀ emissions which leaves a balance of 61.1 tons/year. To fully mitigate the MEC's PM₁₀ emissions, and knowing the shortage of the PM₁₀ emissions in the Bay Area, the Applicant has agreed to provide 124.2 tons/year of VOC emissions to mitigate the 61.1 tons of PM₁₀ emissions per year. According to

CARB guidelines, PM₁₀, VOC, SO_x and NO_x emissions can be used to mitigate PM₁₀ emissions. Staff finds that providing VOC emissions from the San Jose and Mountainview areas to mitigate PM₁₀ emissions at 2:1 ratio is acceptable. The reduction of VOC emissions will reduce the formation of ozone emissions during the summer, and further reduce the PM₁₀ emissions during winter.

AIR QUALITY Table 11
Valid Emission Reduction Credits Proposed
By Calpine/Bechtel

Company Name	Location	BAAQMD Certificate Number ^s	VOC (ton/yr)	NO _x (ton/yr)	PM ₁₀ (ton/yr)
Folgers Coffee	San Jose	413	0	1.31	7.7
Frito Lay	San Jose	426	0	6.42	7.64
Glorietta Foods	San Jose	19	0	32.24	1.54
Raisch Products	Mountainview	507	0	6.5	12.33
Quebecor Facility	San Jose	625	356	0	0
Total Available Emission Reduction Credits			356	46.47	29.21
Total Project Emissions (Project liability)			28	185	91.3
BAAQMD required ratio			1:1	1.15:1	1:1
Required Offsets			28	212.75	91.3
Mitigating PM ₁₀ using PM ₁₀ and VOC (91.3 – 29.21) = 62.09 PM ₁₀ * 2 = 124.2 ton/yr			124.2	0	29.21
Mitigating VOC using VOC			28	0	0
Mitigating NO _x (ton/yr)			166.28	46.47	0
Total required ERC's to fully mitigate MEC			318.48	46.47	29.21
Surplus (+) / Shortage (-) Offsets Balance			+37.52	0	0

Source: Data response dated August 22, 2000

ADDITIONAL CEQA REQUIREMENTS

In addition to the BAAQMD requirements and analysis as presented in the FDOC, staff has required the applicant to provide the following analyses so that staff could reach a conclusion regarding the significance of the impacts of the proposed project:

1. Evaluation of the construction emissions. The Applicant has provided a complete analysis of the construction emissions of the facility including the linear facilities. This information is available in the AFC, Appendix 8.1E-1 and April 28, 2000 submittal.
2. Evaluation of the construction impacts. Calpine/Bechtel has completed these analysis which shows that during construction PM10 and NO2 standards will be violated. Summary of the impact analysis is in AIR QUALITY Table 8.
3. Mitigate construction impacts to less than significant. Staff is requiring the Applicant to comply with conditions of certification 48,49,50 and 52 to mitigate the construction phase impacts of the project.
4. Cumulative impact analysis must be estimated. Calpine/Bechtel submitted the cumulative analysis on April 28, 2000 including future projects within six miles radius from the proposed project. Summary of the analysis is in the "Cumulative Impacts" section of this testimony.
5. Metcalf Energy Center PM10 emissions including cooling towers emissions will be mitigated. The Applicant has provided mitigation package to fully mitigate the MEC's PM10 emission liability of 91.3 tons per year. The package consists of 29.2 tons per year of direct PM10 and 124.2 tons per year of VOC emissions to mitigate 62.1 tons of PM10 emissions. See AIR QUALITY Table 11 for more details.
6. Secondary formation of PM10 emissions has been evaluated. To lower the formation of secondary PM10, Calpine/Bechtel has agreed to lower the project NOx liability from 185 tons per year to 123.4 tons per year, see AIR QUALITY Table 5, and limit the ammonia slip to 118.6 tons per year instead of 237.2 tons per year. Also, Calpine/Bechtel is providing all project offsets from the San Jose Mountainview areas, see AIR QUALITY Table 11 for more details.

COMPLIANCE WITH LORS

FEDERAL

EPA has delegated the implementation of its Prevention of Significant Deterioration (PSD) and Non-attainment New Source Review (NSR) requirements to the BAAQMD. This delegation is only done for air districts that are able to demonstrate to the satisfaction of EPA that their regulatory programs are at least as stringent as the federal PSD and Non-attainment NSR programs. The BAAQMD will issue an

Authority to Construct (ATC) only after this project secures a license from the California Energy Commission, which will be based, in part, on the BAAQMD's Final Determination of Compliance (FDOC).

The ATC will be equivalent to a federal PSD and federal Non-attainment NSR permit. Issuance of the FDOC does not constitute a final PDS permit under 40 CFR 52.21 since EPA currently is involved in a consultation with the Fish and Wildlife Services pursuant to Section 7 of the Endangered Species Act. The consultation concerns the potential impacts of the Metcalf Energy Center on the federal protected bay checkerspot butterfly and is expected to be completed in mid-October, 2000.

In addition, the EPA has also delegated to the BAAQMD the authority to implement the federal Clean Air Act Title V operating permit program. This operating permit is issued only after a facility is in operation and will be included in the BAAQMD's Permit to Operate. Therefore, compliance with the BAAQMD's rules and regulations should result in compliance with federal requirements.

STATE

The project complies with the BAAQMD's rules and regulations as the District interprets them and therefore, with Section 41700 of the California State Health and Safety Code.

LOCAL

The BAAQMD issued its FDOC on August 25, 2000. Based on a review of the FDOC, and the BAAQMD's interpretation of their rules, staff has determined that the project will comply with applicable BAAQMD rules and regulations.

FACILITY CLOSURE

Eventually the Metcalf Energy Center will close, either as a result of the end of its useful life, or through some unexpected situation, such as a natural disaster or catastrophic facility breakdown. When the facility closes, all sources of air emissions would cease and thus all impacts associated with those emissions would no longer occur.

The Permit to Operate, issued by the BAAQMD, is required for operation of the facility and is usually renewed on a five year schedule. However, during those five years, the applicant must still pay permit fees annually. If the applicant chooses to close the facility and not pay the permit fees, then the Permit to Operate would be cancelled. In that event, the project could not restart and operate unless the applicant pays the fees to renew the Permit to Operate.

If the Metcalf Energy Center were to decide to dismantle the project, there would likely be fugitive dust emissions associated with this dismantling effort. The Facility Closure Plan to be submitted to the Energy Commission Compliance Project Manager should indicate that the applicant will comply with the applicable

construction related permit conditions included in the Conditions of Certification, which includes the control of fugitive dust emissions.

RESPONSE TO PUBLIC AND AGENCY COMMENTS

SJ-5: concerned that Tulare Hill is directly adjacent to the site would appear to affect the wind speed and directions and therefore, affect the dispersion of the pollutants.

Response: Staff spoke with Laurel Prevetti with the City of San Jose to further understand her concern. Based on our discussion, An explanation is provided below and more details are in Site Representation section to address the City of San Jose's concern. The Tulare Hill has been taken into account when modeling (using the ISC model) of the MEC was conducted. Receptors grid were placed all around the facility to report the impact (concentration levels) from the project. The grid was placed at 25 meter intervals along the facility's fenceline and 60 at meter intervals for the remaining coarse of the modeling area. Because Tulare Hill terrain extends up to 110 feet above the stack, the downwash effect was measured by the model as well to identify the highest area of impact from the facility.

Furthermore, the City of San Jose has sent a letter to the California Energy Commission dated September 5, 2000, stating that the Applicant has provided insufficient data to show that the project is in compliance with the City's performance standard. The City's performance standard states:

"No manufacturing operation shall be permitted which produces odors, fumes, smoke, or other air-borne pollutants detectable, without instruments, at the property lines of the subject parcel or which produces any dangerous emissions whatsoever."

It is clear that operating the facility will result in air borne pollutants (emissions). The levels of the emissions will be generated from firing two turbines, two IC engines and cooling towers. Sometimes there will be smoke, and maybe odors and fumes will be emitted from the IC engines stacks which are 15 to 20 feet high.

Staff have never, to my knowledge concluded that any gas-fired project had potential significant odor impacts. BAAQMD has concluded, that the project will not result in any community nuisances or annoyances (see FDOC page 24) and that it will comply with air district rules prohibiting odor impacts beyond the property line. Therefore, there is no conflict with local District regulation 7-302.

The two internal combustion (IC) engines that are part of the MEC project are for fire suppression engine burns natural gas and emergency generator burns Diesel. These two engines would not be operated under ordinary circumstances. However, if they are needed, they are permitted to operate under the air district's permit for up to 200 hours per year.

The emergency generator is like any internal combustion engine, it produces air-borne pollutants, and this may include smoke and some odor. Whether such smoke and odor would be detectable at the project "fence-line", approximately 67 feet away at the nearest point, without instrument measurement, is difficult or impossible to determine.

However, IC engines used for safety backup of the type used by MEC are a common feature of urban society. They are employed by hospitals and industrial facilities, including computer chip manufacturers, as well as other facilities requiring emergency generation backup. They are not infrequently located in or adjacent to residential areas. BAAQMD states that there are no less than 2000 IC engines permitted in the San Jose area. Based on discussion with BAAQMD, it seems that these backup facilities do not normally result in a public nuisance as a result of smoke or odor. In fact BAAQMD concluded in its FDOC that the project will not result in any community nuisances or annoyances. In view of the above, Staff believes that the project will comply with City's ordinance, and that it will not create a public nuisance or odor impact.

JW-1 concerned that there will be an air quality degradation if the project is built in the Coyote Valley.

Response please see the project offset section of this testimony in which the Applicant provided full mitigation to the project emission liabilities. Summary of these offsets is in AIR QUALITY Table 11.

JB-1 concerned that there will be an air quality degradation if the project will be built in the Coyote valley.

Response please see the project offset section of this testimony in which the Applicant provided full mitigation to the project emission liabilities. Summary of these offsets is in AIR QUALITY Table 11.

MB-1 concerned that CO2 impact on ground is near zero.

Response No, the CO2 impact is much greater than zero. Please see AIR QUALITY Tables 9 and 10.

PH-4 concerned that carbon monoxide emitted from this project is at 10 ppm and 24.3 ppm.

Response No, since the PSA and PDOC were filled, the Applicant is proposing, except during start-up and shut-downs, a 6 ppm emission limit or equivalent in mass emission at low load scenarios. Please refer to conditions AQ20 (c), AQ20(d), AQ21 and AQ23 in the conditions of certification section of this FSA.

CONCLUSIONS AND RECOMMENDATIONS

Based upon the evidence of record, and assuming the implementation of the following Conditions of Certification, including the conditions contained in the FDOC, the Commission staff agrees with the BAAQMD's findings and concludes that the Metcalf Energy Center will meet all applicable air quality requirements and will not cause any significant air quality impacts.

CONDITION OF CERTIFICATION

METCALF ENERGY CENTER

PERMIT CONDITIONS

Definitions:

Clock Hour:	Any continuous 60-minute period beginning on the hour.
Calendar Day:	Any continuous 24-hour period beginning at 12:00 AM or 0000 hours.
Year:	Any consecutive twelve-month period of time
Heat Input:	All heat inputs refer to the heat input at the higher heating value (HHV) of the fuel, in BTU/scf.
Rolling 3-hour period:	Any three-hour period that begins on the hour and does not include start-up or shutdown periods.
Firing Hours:	Period of time during which fuel is flowing to a unit, measured in fifteen minute increments.
MM BTU:	million british thermal units
Gas Turbine Start-up Mode:	The lesser of the first 180 minutes of continuous fuel flow to the Gas Turbine after fuel flow is initiated or the period of time from Gas Turbine fuel flow initiation until the Gas Turbine achieves two consecutive CEM data points in compliance with the emission concentration limits of conditions 20(b) and 20(d).
Gas Turbine Shutdown Mode:	The lesser of the 30 minute period immediately prior <i>to the termination of fuel flow to the Gas Turbine or the period of time from non-compliance with any requirement listed in Conditions 20(b) through 20(d) until termination of fuel flow to the Gas Turbine.</i>
Specified PAHs:	The polycyclic aromatic hydrocarbons listed below shall be <i>considered to Specified PAHs for these permit conditions. Any emission limits for Specified PAHs refer to the sum of the emissions for all six of the following compounds.</i> <div><div>Benzo[a]anthracene</div><div>Benzo[b]fluoranthene</div><div>Benzo[k]fluoranthene</div><div>Benzo[a]pyrene</div><div>Dibenzo[a,h]anthracene</div><div>Indeno[1,2,3-cd]pyrene</div></div>
Corrected Concentration:	The concentration of any pollutant (generally NO _x , CO, or NH ₃) corrected to a standard stack gas oxygen concentration. For emission point P-1 (combined exhaust of S-1 Gas Turbine and S-2 HRSG duct burners) and emission point P-2 (combined exhaust of S-3 Gas Turbine and S-4 HRSG duct burners) the standard stack gas oxygen concentration is 15% O ₂ by volume on a dry basis
Commissioning Activities:	All testing, adjustment, tuning, and calibration

	activities recommended by the equipment manufacturers and the MEC construction contractor to insure safe and reliable steady state operation of the gas turbines, heat recovery steam generators, steam turbine, and associated electrical delivery systems.
Commissioning Period:	The Period shall commence when all mechanical, electrical, and control systems are installed and individual system start-up has been completed, or when a gas turbine is first fired, whichever occurs first. The period shall terminate when the plant has completed performance testing, is available for commercial operation, and has initiated sales to the power exchange.
Precursor Organic Compounds (POCs):	Any compound of carbon, excluding methane, ethane, carbon monoxide, carbon dioxide, carbonic acid, metallic carbides or carbonates, and ammonium carbonate
CEC CPM:	California Energy Commission Compliance Program Manager
MEC:	Metcalf Energy Center

CONDITIONS FOR THE COMMISSIONING PERIOD

AQ1 The owner/operator of the Metcalf Energy Center (MEC) shall minimize emissions of carbon monoxide and nitrogen oxides from S-1 and S-3 Gas Turbines and S-2 and S-4 Heat Recovery Steam Generators (HRSGs) to the maximum extent possible during the commissioning period. Conditions 1 through 12 shall only apply during the commissioning period as defined above. Unless otherwise indicated, Conditions 13 through 47 shall apply after the commissioning period has ended.

Verification: The owner/operator shall submit a monthly compliance report to the California Energy Commission Compliance manager (CPM). In this report the owner/operator shall indicate how this condition is being implemented.

AQ2 At the earliest feasible opportunity in accordance with the recommendations of the equipment manufacturers and the construction contractor, the S-1 & S-3 Gas Turbine combustors and S-2 & S-4 Heat Recovery Steam Generator duct burners shall be tuned to minimize the emissions of carbon monoxide and nitrogen oxides.

Verification: In the monthly compliance report the owner/operator shall indicate how this condition is being implemented.

AQ3 At the earliest feasible opportunity in accordance with the recommendations of the equipment manufacturers and the construction contractor, the A-1 and A-2 SCR Systems shall be installed, adjusted, and operated to minimize the

emissions of carbon monoxide and nitrogen oxides from S-1 & S-3 Gas Turbines and S-2 & S-4 Heat Recovery Steam Generators.

Verification: Verification: In the monthly compliance report the owner/operator shall indicate how this condition is being implemented.

AQ4 Coincident with the steady-state operation of A-1 & A-2 SCR Systems pursuant to conditions 3, 10, 11, and 12, the Gas Turbines (S-1 & S-3) and the HRSGs (S-2 & S-4) shall comply with the NO_x and CO emission limitations specified in conditions 20(a) through 20(d).

Verification: In the monthly compliance report the owner/operator shall indicate how this condition is being implemented.

AQ5 The owner/operator of the MEC shall submit a plan to the District Permit Services Division and the CEC CPM at least four weeks prior to first firing of S-1 or S-3 Gas Turbines describing the procedures to be followed during the commissioning of the turbines, HRSGs, and steam turbine. The plan shall include a description of each commissioning activity, the anticipated duration of each activity in hours, and the purpose of the activity. The activities described shall include, but not be limited to, the tuning of the Dry-Low-NO_x combustors, the installation and operation of the required emission control systems, the installation, calibration, and testing of the CO and NO_x continuous emission monitors, and any activities requiring the firing of the Gas Turbines (S-1 & S-3) and HRSGs (S-2 & S-4) without abatement by their respective SCR Systems. Neither Gas Turbine (S-1 or S-3) shall be fired sooner than 28 days after the District receives the commissioning plan.

Verification: At least 28 days prior to first firing of the gas turbines, the Project owner shall submit a complete commissioning plan.

AQ6 During the commissioning period, the owner/operator of the MEC shall demonstrate compliance with conditions 8 through 10 through the use of properly operated and maintained continuous emission monitors and data recorders for the following parameters:

- firing hours
- fuel flow rates
- stack gas nitrogen oxide emission concentrations,
- stack gas carbon monoxide emission concentrations
- stack gas oxygen concentrations.

The monitored parameters shall be recorded at least once every 15 minutes (excluding normal calibration periods or when the monitored source is not in operation) for the Gas Turbines (S-1 & S-3) and HRSGs (S-2 & S-4). The owner/operator shall use District-approved methods to calculate heat input rates, nitrogen dioxide mass emission rates, carbon monoxide mass emission rates, and NO_x and CO emission concentrations, summarized for each clock hour and each calendar day. All records shall be retained on site for at least 5 years from the date of entry and made available to District personnel upon request.

Verification: In the monthly compliance report to the CPM the owner/operator shall indicate how this condition is being implemented.

AQ7 The District-approved continuous monitors specified in condition 8 shall be installed, calibrated, and operational prior to first firing of the Gas Turbines (S-1 & S-3) and Heat Recovery Steam Generators (S-2 & S-4). After first firing of the turbines, the detection range of these continuous emission monitors shall be adjusted as necessary to accurately measure the resulting range of CO and NOx emission concentrations. The type, specifications, and location of these monitors shall be subject to District review and approval.

Verification: In the monthly compliance report to the CPM the owner/operator shall indicate how this condition is being implemented.

AQ8 The total number of firing hours of S-1 Gas Turbine and S-2 Heat Recovery Steam Generator without abatement of nitrogen oxide emissions by A-1 SCR System shall not exceed 300 hours during the commissioning period. Such operation of S-1 Gas Turbine and S-2 HRSG without abatement shall be limited to discrete commissioning activities that can only be properly executed without the SCR system in place. Upon completion of these activities, the owner/operator shall provide written notice to the District Permit Services and Enforcement Divisions and the unused balance of the 300 firing hours without abatement shall expire.

Verification: In the monthly compliance report the owner/operator shall indicate the cumulative number of firing without SCR. The owner/operator shall submit a copy of the completion notice to the CPM.

AQ9 The total number of firing hours of S-3 Gas Turbine and S-4 Heat Recovery Steam Generator without abatement of nitrogen oxide emissions by A-3 SCR System shall not exceed 300 hours during the commissioning period. Such operation of S-3 Gas Turbine and S-4 HRSG without abatement shall be limited to discrete commissioning activities that can only be properly executed without the SCR system in place. Upon completion of these activities, the owner/operator shall provide written notice to the District Permit Services and Enforcement Divisions and the unused balance of the 300 firing hours without abatement shall expire.

Verification: In the monthly compliance report the owner/operator shall indicate the cumulative number of firing without SCR. The owner/operator shall submit a copy of the completion notice to the CPM.

AQ10 The total mass emissions of nitrogen oxides, carbon monoxide, precursor organic compounds, PM10, and sulfur dioxide that are emitted by the Gas Turbines (S-1 & S-3) and Heat Recovery Steam Generators (S-2 & S-4) during the commissioning period shall accrue towards the consecutive twelve-month emission limitations specified in condition 25, except that total, cumulative NOx mass emissions from S-1, S-2, S-3, and S-4 shall not exceed 185 tons during any consecutive twelve-month period which includes a portion of the Commissioning Period.

Verification: In the monthly compliance report the owner/operator shall indicate the cumulative number of firing without SCR. The owner/operator shall submit a copy of the completion notice to the CPM.

AQ11 Combined pollutant mass emissions from the Gas Turbines (S-1 & S-3) and Heat Recovery Steam Generators (S-2 & S-4) shall not exceed the following limits during the commissioning period. These emission limits shall include emissions resulting from the start-up and shutdown of the Gas Turbines (S-1 & S-3).

NO _x (as NO ₂)	4,805 pounds per calendar day	381.2 pounds per hour
CO	11,498 pounds per calendar day	930 pounds per hour
POC (as CH ₄)	495 pounds per calendar day	
PM ₁₀	468 pounds per calendar day	
SO ₂	42 pounds per calendar day	

Verification: In the monthly compliance report the owner/operator shall indicate any violations of the above emission limits.

AQ12 Prior to the end of the Commissioning Period, the Owner/Operator shall conduct a District and CEC approved source test using external continuous emission monitors to determine compliance with condition 21. The source test shall determine NO_x, CO, and POC emissions during start-up and shutdown of the gas turbines. The POC emissions shall be analyzed for methane and ethane to account for the presence of unburned natural gas. The source test shall include a minimum of three start-up and three shutdown periods. Twenty working days before the execution of the source tests, the Owner/Operator shall submit to the District and the CEC Compliance Program Manager (CPM) a detailed source test plan designed to satisfy the requirements of this condition. The District and the CEC CPM will notify the Owner/Operator of any necessary modifications to the plan within 20 working days of receipt of the plan; otherwise, the plan shall be deemed approved. The Owner/Operator shall incorporate the District and CEC CPM comments into the test plan. The Owner/Operator shall notify the District and the CEC CPM within seven (7) working days prior to the planned source testing date. Source test results shall be submitted to the District and the CEC CPM within 30 days of the source testing date.

Verification: Verification: Approval of the source test plan and receipt of the source test reports is the verification of compliance with this condition.

Conditions for the Gas Turbines (S-1 & S-3) and the Heat Recovery Steam Generators (HRSGs; S-2 & S-4)

AQ13 The Gas Turbines (S-1 and S-3) and HRSG Duct Burners (S-2 and S-4) shall be fired exclusively on natural gas. (BACT for SO₂ and PM₁₀)

Verification: As part of the semiannual Air Quality Reports (as required by AQ-43), the project owner shall indicate the date, time, and duration of any violation of this condition.

AQ14 The combined heat input rate to each power train consisting of a Gas Turbine and its associated HRSG (S-1 & S-2 and S-3 & S-4) shall not exceed 2,124 MM BTU per hour, averaged over any rolling 3-hour period. (PSD for NO_x).

Verification: As part of the Air Quality monthly Reports, the owner/operator shall include information on the date and time when the hourly fuel consumption exceeded this hourly limit.

AQ15 The combined heat input rate to each power train consisting of a Gas Turbine and its associated HRSG (S-1 & S-2 and S-3 & S-4) shall not exceed 49,908 MM BTU per calendar day. (PSD for PM₁₀)

Verification: As part of the Air Quality monthly Reports, the owner/operator shall include information on the date and time when the daily fuel consumption exceeded this daily limit.

AQ16 The combined cumulative heat input rate for the Gas Turbines (S-1 & S-3) and the HRSGs (S-2 & S-4) shall not exceed 35,274,060 MM BTU per year. (Offsets)

Verification: As part of the Air Quality monthly Reports, the owner/operator shall include information on the date and time when the daily fuel consumption exceeded this daily limit.

AQ17 The HRSG duct burners (S-2 and S-4) shall not be fired unless its associated Gas Turbine (S-1 and S-3, respectively) is in operation. (BACT for NO_x)

Verification: As part of the Air Quality Reports, the owner/operator shall include information on the date, time, and duration of any violation of this permit condition.

AQ18 S-1 Gas Turbine and S-2 HRSG shall be abated by the properly operated and properly maintained A-1 Selective Catalytic Reduction (SCR) System whenever fuel is combusted at those sources and the A-1 catalyst bed has reached minimum operating temperature. (BACT for NO_x)

Verification: As part of the semiannual Air Quality Reports, the owner/operator shall provide information on any major problem in the operation of the Oxidizing Catalyst and Selective Catalytic Reduction Systems for the Gas Turbines and HRSGs. The information shall include, at a minimum, the date and description of the problem and the steps taken to resolve the problem.

AQ19 S-3 Gas Turbine and S-4 HRSG shall be abated by the properly operated and properly maintained A-2 Selective Catalytic Reduction (SCR) System whenever fuel is combusted at those sources and the A-2 catalyst bed has reached minimum operating temperature. (BACT for NO_x)

Verification: As part of the semiannual Air Quality Reports, the owner/operator shall provide information on any major problem in the operation of the Oxidizing Catalyst and Selective Catalytic Reduction Systems for the Gas Turbines and HRSGs. The information shall include, at a minimum, the date and description of the problem and the steps taken to resolve the problem.

AQ20 The Gas Turbines (S-1 & S-3) and HRSGs (S-2 & S-4) shall comply with requirements (a) through (h) under all operating scenarios, including duct burner firing mode and steam injection power augmentation mode. Requirements (a) through (h) do not apply during a gas turbine start-up or shutdown. (BACT, PSD, and Toxic Risk Management Policy)

(a) Nitrogen oxide mass emissions (calculated as NO₂) at P-1 (the combined exhaust point for the S-1 Gas Turbine and the S-2 HRSG after abatement by A-1 SCR System) shall not exceed 19.2 pounds per hour or 0.00904 lb/MM BTU (HHV) of natural gas fired. Nitrogen oxide mass emissions (calculated as NO₂) at P-2 (the combined exhaust point for the S-3 Gas Turbine and the S-4 HRSG after abatement by A-3 SCR System) shall not exceed 19.2 pounds per hour or 0.00904 lb/MM BTU (HHV) of natural gas fired. (PSD for NO_x)

(b) The nitrogen oxide emission concentration at emission points P-1 and P-2 each shall not exceed 2.5 ppmv, on a dry basis, corrected to 15% O₂, averaged over any 1-hour period. (BACT for NO_x)

(c) Carbon monoxide mass emissions at P-1 and P-2 each shall not exceed 28.07 pounds per hour, averaged over any rolling 3-hour period. (PSD for CO)

(d) When the heat input to a combustion turbine exceeds 1700 MM BTU/hr (HHV), the carbon monoxide emission concentration at P-1 and P-2 each shall not exceed 6.0 ppmv, on a dry basis, corrected to 15% O₂, and the carbon monoxide mass emission rate at P-1 and P-2 each shall not exceed 0.0132 lb/MM BTU of natural gas fired, averaged over any rolling 3-hour period. If compliance source test results and continuous emission monitoring data indicate that a lower CO emission concentration level can be achieved on a consistent basis (with a suitable compliance margin) over the entire range of turbine operating conditions, including duct firing and power steam augmentation operations, and over the entire range of ambient conditions, the District will reduce this limit to a level not lower than 4.0 ppmv, on a dry basis, corrected to 15% O₂. If this limit is reduced, the corresponding mass emission rate limit specified in condition 20(c) shall also be modified to reflect this reduction. (BACT for CO)

(e) Ammonia (NH₃) emission concentrations at P-1 and P-2 each shall not exceed 5 ppmv, on a dry basis, corrected to 15% O₂, averaged over any rolling 3-hour period. This ammonia emission concentration shall be verified by the continuous recording of the ammonia injection rate to A-1 and A-2

SCR Systems. The correlation between the gas turbine and HRSG heat input rates, A-1 and A-2 SCR System ammonia injection rates, and corresponding ammonia emission concentration at emission points P-1 and P-2 shall be determined in accordance with permit condition 30. (TRMP for NH₃)

(f) Precursor organic compound (POC) mass emissions (as CH₄) at P-1 and P-2 each shall not exceed 2.7 pounds per hour or 0.00126 lb/MM BTU of natural gas fired. (BACT)

(g) Sulfur dioxide (SO₂) mass emissions at P-1 and P-2 each shall not exceed 1.28 pounds per hour or 0.0006 lb/MM BTU of natural gas fired. (BACT)

(h) Particulate matter (PM₁₀) mass emissions at P-1 and P-2 each shall not exceed 9 pounds per hour or 0.00452 lb PM₁₀/MM BTU of natural gas fired when HRSG duct burners are not in operation. Particulate matter (PM₁₀) mass emissions at P-1 and P-2 each shall not exceed 12 pounds per hour or 0.00565 lb PM₁₀/MM BTU of natural gas fired when HRSG duct burners are in operation. (BACT)

Verification: As part of the semiannual Air Quality Reports, the owner/operator shall indicate the date, time, and duration of any violation of this Condition. The owner/operator shall also include quantitative information on the severity of the violation.

AQ21 The regulated air pollutant mass emission rates from each of the Gas Turbines (S-1 and S-3) during a start-up or a shutdown shall not exceed the limits established below. (PSD)

	Start-Up (lb/start-up)	Start-Up (lb/hr)	Shutdown (lb/shutdown)
Oxides of Nitrogen (as NO ₂)	240	80	18
Carbon Monoxide (CO)	2,514	902	43.8
Precursor Organic Compounds (as CH ₄)	48	16	5

Verification: As part of the semiannual Air Quality Reports, the owner/operator shall indicate the date, time, and duration of any violation of this Condition. The owner/operator shall also include quantitative information on the severity of the violation.

AQ22 The Gas Turbines (S-1 and S-3) shall not be in start-up mode simultaneously. (PSD)

Verification: In the monthly compliance report the owner/operator shall indicate any violations of this condition.

AQ23 The heat recovery steam generators (S-2 & S-4) and associated ducting shall be designed and constructed such that an oxidation catalyst can be readily installed and properly operated if deemed necessary by the APCO to insure

compliance with the CO emission rate limitations of conditions 20(c) and 20(d). (BACT)

Verification: In the semiannual air quality compliance report the owner/operator shall indicate how this condition is being implemented.

AQ24 Total combined emissions from the Gas Turbines and HRSGs (S-1, S-2, S-3, and S-4), including emissions generated during Gas Turbine start-ups and shutdowns shall not exceed the following limits during any calendar day:

- | | | |
|-----|---|--------|
| (a) | 1,362.6 pounds of NO _x (as NO ₂) per day | (CEQA) |
| (b) | 7,891.1 pounds of CO per day | (PSD) |
| (c) | 230.2 pounds of POC (as CH ₄) per day | (CEQA) |
| (d) | 510 pounds of PM ₁₀ per day | (PSD) |
| (e) | 57.9 pounds of SO ₂ per day | (BACT) |

Verification: Verification: As part of the semiannual Air Quality Reports, the owner/operator shall indicate the date of any violation of this Condition including quantitative information on the severity of the violation.

AQ25 Cumulative combined emissions from the Gas Turbines and HRSGs (S-1, S-2, S-3, and S-4), including emissions generated from cooling towers and during gas turbine start-ups and shutdowns shall not exceed the following limits during any consecutive twelve-month period:

- | | | |
|-----|--|----------------------------|
| (a) | 123.4 tons of NO _x (as NO ₂) per year | (Offsets) |
| (b) | 588 tons of CO per year | (Cumulative Increase, PSD) |
| (c) | 28 tons of POC (as CH ₄) per year | (Offsets) |
| (d) | 91.3 tons of PM ₁₀ per year | (Offsets) |
| (e) | 10.6 tons of SO ₂ per year | (Cumulative Increase) |

Verification: As part of the annual Air Quality Reports, the owner/operator shall indicate the date of any violation of this Condition including quantitative information on the severity of the violation.

AQ26 The maximum projected annual toxic air contaminant emissions (per condition 29) from the Gas Turbines and HRSGs combined (S-1, S-2, S-3, and S-4) shall not exceed the following limits:

- | | |
|---|-------------------------|
| formaldehyde | 3,796 pounds per year |
| benzene | 480 pounds of per year |
| Specified polycyclic aromatic hydrocarbons (PAHs) | 22.8 pounds of per year |
- unless the following requirement is satisfied:

The owner/operator shall perform a health risk assessment using the emission rates determined by source test and the most current Bay Area Air Quality Management District approved procedures and unit risk factors in effect at the time of the analysis. This risk analysis shall be submitted to the District and the CEC CPM within 60 days of the source test date. The owner/operator may request that the

District and the CEC CPM revise the carcinogenic compound emission limits specified above. If the owner/operator demonstrates to the satisfaction of the APCO that these revised emission limits will result in a cancer risk of not more than 1.0 in one million, the District and the CEC CPM may, at their discretion, adjust the carcinogenic compound emission limits listed above. (TRMP)

Verification: As part of the annual Air Quality Reports, the owner/operator shall indicate the date, duration, and severity of any violations of this Condition including quantitative information on the severity of the violation.

AQ27 The owner/operator shall demonstrate compliance with conditions 14 through 17, 20(a) through 20(d), 21, 22, 24(a), 24(b), 25(a), and 25(b) by using properly operated and maintained continuous monitors (during all hours of operation including equipment Start-up and Shutdown periods) for all of the following parameters:

- (a) Firing Hours and Fuel Flow Rates for each of the following sources: S-1 & S-2 combined and S-3 & S-4 combined.
- (b) Oxygen (O₂) Concentrations, Nitrogen Oxides (NO_x) Concentrations, and Carbon Monoxide (CO) Concentrations at each of the following exhaust points: P-1 and P-2.
- (c) Ammonia injection rate at A-1 and A-2 SCR Systems
- (d) Steam injection rate at S-1 & S-3 Gas Turbine Combustors

The owner/operator shall record all of the above parameters every 15 minutes (excluding normal calibration periods) and shall summarize all of the above parameters for each clock hour. For each calendar day, the owner/operator shall calculate and record the total firing hours, the average hourly fuel flow rates, and pollutant emission concentrations.

The owner/operator shall use the parameters measured above and District-approved calculation methods to calculate the following parameters:

- (e) Heat Input Rate for each of the following sources: S-1 & S-2 combined and S-3 & S-4 combined.
- (f) Corrected NO_x concentrations, NO_x mass emissions (as NO₂), corrected CO concentrations, and CO mass emissions at each of the following exhaust points: P-1 and P-2.

For each source, source grouping, or exhaust point, the owner/operator shall record the parameters specified in conditions 27(e) and 27(f) at least once every 15 minutes (excluding normal calibration periods). As specified below, the owner/operator shall calculate and record the following data:

- (g) (g) total Heat Input Rate for every clock hour and the average hourly Heat Input Rate for every rolling 3-hour period.
- (h) (h) on an hourly basis, the cumulative total Heat Input Rate for each calendar day for the following: each Gas Turbine and associated HRSG combined and all four sources (S-1, S-2, S-3, and S-4) combined.

- (i) the average NOx mass emissions (as NO₂), CO mass emissions, and corrected NOx and CO emission concentrations for every clock hour and for every rolling 3-hour period.
- (j) on an hourly basis, the cumulative total NOx mass emissions (as NO₂) and the cumulative total CO mass emissions, for each calendar day for the following: each Gas Turbine and associated HRSG combined, and all four sources (S-1, S-2, S-3, and S-4) combined.
- (k) For each calendar day, the average hourly Heat Input Rates, Corrected NOx emission concentrations, NOx mass emissions (as NO₂), corrected CO emission concentrations, and CO mass emissions for each Gas Turbine and associated HRSG combined.
- (l) on a daily basis, the cumulative total NOx mass emissions (as NO₂) and cumulative total CO mass emissions, for the previous consecutive twelve month period for all four sources (S-1, S-2, S-3, and S-4) combined.
(1-520.1, 9-9-501, BACT, Offsets, NSPS, PSD, Cumulative Increase)

Verification: As part of the annual Air Quality Reports, the owner/operator shall indicate the date of any violation of this Condition including quantitative information on the severity of the violation.

AQ28 To demonstrate compliance with conditions 20(f), 20(g), 20(h), 21, 24(c) through 24(e), and 25(c) through 25(e), the owner/operator shall calculate and record on a daily basis, the Precursor Organic Compound (POC) mass emissions, Fine Particulate Matter (PM₁₀) mass emissions (including condensable particulate matter), and Sulfur Dioxide (SO₂) mass emissions from each power train. The owner/operator shall use the actual Heat Input Rates calculated pursuant to condition 27, actual Gas Turbine Start-up Times, actual Gas Turbine Shutdown Times, and CEC and District-approved emission factors to calculate these emissions. The calculated emissions shall be presented as follows:

- (a) For each calendar day, POC, PM₁₀, and SO₂ emissions shall be summarized for: each power train (Gas Turbine and its respective HRSG combined) and all four sources (S-1, S-2, S-3, and S-4) combined.
- (b) on a daily basis, the cumulative total POC, PM₁₀, and SO₂ mass emissions, for each year for all four sources (S-1, S-2, S-3, and S-4) combined.
(Offsets, PSD, Cumulative Increase)

Verification: As part of the monthly Air Quality Reports, the owner/operator shall indicate the date of any violation of this Condition including quantitative information on the severity of the violation.

AQ29 To demonstrate compliance with Condition 26, the owner/operator shall calculate and record on an annual basis the maximum projected annual emissions of: Formaldehyde, Benzene, and Specified PAH's. Maximum

projected annual emissions shall be calculated using the maximum Heat Input Rate of 35,274,060 MM BTU/year and the highest emission factor (pounds of pollutant per MM BTU of Heat Input) determined by any source test of the S-1 & S-3 Gas Turbines and/or S-2 & S-4 Heat Recovery Steam Generators. If the highest emission factor for a given pollutant occurs during minimum-load turbine operation, a reduced annual heat input rate may be utilized to calculate the maximum projected annual emissions to reflect the reduced heat input during gas turbine start-up and minimum-load operation. The reduced annual heat input rate shall be subject to the review and approval of the District. (TRMP)

Verification: As part of the annual Air Quality Reports, the owner/operator shall indicate the date of any violation of this Condition including quantitative information on the severity of the violation

AQ30 Within 60 days of start-up of the MEC, the owner/operator shall conduct a District-approved source test on exhaust point P-1 or P-2 to determine the corrected ammonia (NH₃) emission concentration to determine compliance with condition 20(e). The source test shall determine the correlation between the heat input rates of the gas turbine and associated HRSG, A-1 or A-2 SCR System ammonia injection rate, and the corresponding NH₃ emission concentration at emission point P-1 or P-2. The source test shall be conducted over the expected operating range of the turbine and HRSG (including, but not limited to, minimum and 100% load) to establish the range of ammonia injection rates necessary to achieve NO_x emission reductions while maintaining ammonia slip levels. Continuing compliance with condition 20(e) shall be demonstrated through calculations of corrected ammonia concentrations based upon the source test correlation and continuous records of ammonia injection rate. (TRMP)

Verification: At least 90 days before start-up, the owner/operator shall provide a copy of the source test protocols. Approval of the source test protocols and the source test reports shall be deemed as verification for this condition. The owner/operator shall notify the District and the CEC CPM within seven (7) working days before the execution of the source tests required in this condition. Source test results shall be submitted to the District and to the CEC CPM within 30 days of the date of the tests.

AQ31. Within 60 days of start-up of the MEC and on an annual basis thereafter, the owner/operator shall conduct a District-approved source test on exhaust points P-1 and P-2 while each Gas Turbine and associated Heat Recovery Steam Generator are operating at maximum load (including steam injection power augmentation mode) to determine compliance with Conditions 20(a), (b), (c), (d), (f), (g), and (h), while each Gas Turbine and associated Heat Recovery Steam Generator are operating at minimum load to determine compliance with Conditions 20(c) and (d), and to verify the accuracy of the continuous emission monitors required in condition 29. The owner/operator shall test for (as a minimum): water content, stack gas flow rate, oxygen concentration, precursor organic compound concentration and mass

emissions, nitrogen oxide concentration and mass emissions (as NO₂), carbon monoxide concentration and mass emissions, sulfur dioxide concentration and mass emissions, methane, ethane, and particulate matter (PM₁₀) emissions including condensable particulate matter. (BACT, offsets)

Verification: At least 90 days before start-up, the owner/operator shall provide a copy of the source test protocols. Approval of the source test protocols, as required in condition 58, and the source test reports shall be deemed as verification for this condition. The owner/operator shall notify the District and the CEC CPM within seven (7) working days before the execution of the source tests required in this condition. Source test results shall be submitted to the District and to the CEC CPM within 30 days of the date of the tests.

AQ32. The owner/operator shall obtain approval for all source test procedures from the District's Source Test Section and the CEC CPM prior to conducting any tests. The owner/operator shall comply with all applicable testing requirements for continuous emission monitors as specified in Volume V of the District's Manual of Procedures. The owner/operator shall notify the District's Source Test Section and the CEC CPM in writing of the source test protocols and projected test dates at least 7 days prior to the testing date(s). As indicated above, the Owner/Operator shall measure the contribution of condensable PM (back half) to the total PM₁₀ emissions. However, the Owner/Operator may propose alternative measuring techniques to measure condensable PM such as the use of a dilution tunnel or other appropriate method used to capture semi-volatile organic compounds. Source test results shall be submitted to the District and the CEC CPM within 60 days of conducting the tests. (BACT)

Verification: At least 90 days before start-up, the owner/operator shall provide a copy of the source test protocols. Approval of the source test procedures and receipt of source test results will be deemed as verification of this condition.

AQ33. Within 60 days of start-up of the MEC and on an biennial basis (once every two years) thereafter, the owner/operator shall conduct a District-approved source test on exhaust point P-1 or P-2 while the Gas Turbine and associated Heat Recovery Steam Generator are operating at maximum allowable operating rates to demonstrate compliance with Condition 26. The gas turbine shall also be tested at minimum load. If three consecutive biennial source tests demonstrate that the annual emission rates calculated pursuant to condition 29 for any of the compounds listed below are less than the BAAQMD Toxic Risk Management Policy trigger levels shown, then the owner/operator may discontinue future testing for that pollutant:

Benzene	(26.8 pounds/year
Formaldehyde		< 132 pounds/year
Specified PAH's	(0.18 pounds/year
		(TRMP)

Verification: Verification: The owner/operator shall notify the District and the CEC CPM at least (7) working days before the owner/operator plans to conduct

source testing as required by this condition. Source test results shall be submitted to the District and the CEC CPM within thirty (30) days of conducting the test.

AQ34. The owner/operator of the MEC shall submit all reports (including, but not limited to monthly CEM reports, monitor breakdown reports, emission excess reports, equipment breakdown reports, etc.) as required by District Rules or Regulations and in accordance with all procedures and time limits specified in the Rule, Regulation, Manual of Procedures, or Enforcement Division Policies & Procedures Manual. (Regulation 2-6-502)

Verification: At least 90 days before start-up, the owner/operator shall provide a copy of the test protocols. Submittal of the reports to the CEC CPM constitutes verification of compliance with this condition. All reports shall be submitted to the CEC CPM within when they are due according to District Rules and Regulations.

AQ35. The owner/operator of the MEC shall maintain all records and reports on site for a minimum of 5 years. These records shall include but are not limited to: continuous monitoring records (firing hours, fuel flows, emission rates, monitor excesses, breakdowns, etc.), source test and analytical records, natural gas sulfur content analysis results, emission calculation records, records of plant upsets and related incidents. The owner/operator shall make all records and reports available to District and the CEC CPM staff upon request. (Regulation 2-6-501)

Verification: During site inspection, the owner/operator shall make all records and reports available to the District, California Air Resources Board, and CPM.

AQ36. The owner/operator of the MEC shall notify the District and the CEC CPM of any violations of these permit conditions. Notification shall be submitted in a timely manner, in accordance with all applicable District Rules, Regulations, and the Manual of Procedures. Notwithstanding the notification and reporting requirements given in any District Rule, Regulation, or the Manual of Procedures, the owner/operator shall submit written notification (facsimile is acceptable) to the Enforcement Division within 96 hours of the violation of any permit condition. (Regulation 2-1-403)

Verification: Submittal of these notifications as required by this condition is the verification of these permit conditions. In addition, as part of the Air Quality Reports, the owner/operator shall include information on the dates when these violations occurred and when the owner/operator notified the District and the CEC CPM.

AQ37. The stack height of emission points P-1 and P-2 shall each be at least 145 feet above grade level at the stack base. (PSD, TRMP)

Verification: At least 45 days prior to the release to the manufacturer of the emission stack's "approved for construction" drawings, the Owner/Operator shall submit the drawings to the CEC CPM for review and approval.

AQ38. The Owner/Operator of MEC shall provide adequate stack sampling ports and platforms to enable the performance of source testing. The location and configuration of the stack sampling ports shall be subject to BAAQMD review and approval. (Regulation 1-501)

Verification: Verification: At least one hundred and twenty (120) days before initial operation, the Owner/Operator shall submit to the BAAQMD and the CEC CPM a plan for the installation of stack sampling ports and platforms. Within sixty (60) days of receipt of the plan, the BAAQMD will advise the Owner/Operator and the CEC CPM of the acceptability of the plan; otherwise the plan shall be deemed approved.

AQ39. Within 180 days of the issuance of the Authority to Construct for the MEC, the Owner/Operator shall contact the BAAQMD Technical Services Division regarding requirements for the continuous emission monitors, sampling ports, platforms, and source tests required by conditions 27, 30, 31, 33, and 47. All source testing and monitoring shall be conducted in accordance with the BAAQMD Manual of Procedures. (Regulation 1-501)

Verification: The owner/operator shall notify the CEC CPM at least seven (7) working days before these contacts are made.

AQ40. Prior to the issuance of the BAAQMD Authority to Construct for the Metcalf Energy Center, the Owner/Operator shall demonstrate that valid emission reduction credits in the amount of 212.75 tons/year of Nitrogen Oxides and 28 tons/year of Precursor Organic Compounds or equivalent (as defined by District Regulations 2-2-302.1 and 2-2-302.2) are under their control through enforceable contracts, option to purchase agreements, or equivalent binding legal documents. (Offsets)

Verification: No more than 30 days after the issuance of an Authority to Construct, the Owner/Operator shall provide a copy of the ATC to the CEC CPM for review.

AQ41. Prior to the start of construction of the Metcalf Energy Center, the Owner/Operator shall provide to the District valid emission reduction credit banking certificates in the amount of 212.75 tons/year of Nitrogen Oxides and 28 tons/year of Precursor Organic Compounds or equivalent as defined by District Regulations 2-2-302.1 and 2-2-302.2. (Offsets, CEC)

Verification: At least 30 days prior to the start of construction, the owner/operator must submit a copy of the required offset or emission reduction credit (ERCs) certificates to the CEC CPM.

AQ42. Pursuant to BAAQMD Regulation 2, Rule 6, section 404.1, the owner/operator of the MEC shall submit an application to the BAAQMD for a major facility review permit within 12 months of the issuance of the PSD permit for the MEC. (Regulation 2-6-404.1)

Verification: The owner/operator shall notify the CEC CPM of the submittal of this application. In addition, the owner/operator shall submit to the CPM a copy of the Federal (Title V) Operating Permit within 30 days after it is issued by the District.

AQ43. Pursuant to 40 CFR Part 72.30(b)(2)(ii) of the Federal Acid Rain Program, the owner/operator of the Metcalf Energy Center shall submit an application for a Title IV operating permit to the BAAQMD. Operation of any of the gas turbines (S-1 & S-3) or HRSGs (S-2 & S-4) without a Title IV operating permit may not occur sooner than 24 months after the application is received by the BAAQMD. (Regulation 2, Rule 7)

Verification: At least 24 months before the initial operation, the owner/operator shall submit to the CEC CPM a copy of the application for the Title IV operating permit.

AQ44. The Metcalf Energy Center shall comply with the continuous emission monitoring requirements of 40 CFR Part 75. (Regulation 2, Rule 7)

Verification: At least 60 days before the initial operation, the owner/operator shall submit to the CEC CPM a plan on how the measurements and recordings required by this condition will be performed. Submittal of the reports will also provide verification of compliance with this condition.

AQ45. The owner/operator shall take monthly samples of the natural gas combusted at the MEC. The samples shall be analyzed for sulfur content using District-approved laboratory methods. The sulfur content test results shall be retained on site for a minimum of five years from the test date and shall be utilized to satisfy the requirements of 40 CFR Part 60, subpart GG. (cumulative increase)

Verification: The owner/operator shall maintain on site the records of all the guarantees received from its natural gas suppliers indicating that the fuel delivered to DEC complies with the 40 CFR Part 60, Subpart GG. These records shall be made available to the District or the CEC CPM upon request during on-site compliance inspections.

AQ46. The cooling towers shall be properly installed and maintained to minimize drift losses. The cooling towers shall be equipped with high-efficiency mist eliminators with a maximum guaranteed drift rate of 0.0005%. The maximum total dissolved solids (TDS) measured at the base of the cooling towers or at the point of return to the wastewater facility shall not be higher than 5,438 ppmv (mg/l). The owner/operator shall sample the water at least once per day. (PSD)

Verification: At least 30 days prior to installation, the owner/operator shall submit to the CEC CPM a performance guarantee letter from the cooling tower manufacturer. As part of the compliance record, the owner/operator shall keep records on-site on the TSC content of water in the cooling tower.

AQ47. The owner/operator shall perform a visual inspection of the cooling tower drift eliminators at least once per calendar year, and repair or replace any drift eliminator components which are broken or missing. Prior to the initial operation of the Metcalf Energy Center, the owner/operator shall have the cooling tower vendor's field representative inspect the cooling tower drift eliminators and certify that the installation was performed in a satisfactory manner. Within 60 days of the initial operation of the cooling tower, the owner/operator shall perform an initial performance source test to determine the PM10 emission rate from the cooling tower to verify compliance with the vendor-guaranteed drift rate specified in condition 46. The CPM may, in years 5 and 15 of cooling tower operation, require the owner/operator to perform source tests to verify continued compliance with the vendor-guaranteed drift rate specified in condition 46. (PSD)

Verification: As part of the monthly Air Quality Reports, the owner/operator shall indicate the date of any violation of this Condition including quantitative information on the severity of the violation.

For the purposes of the following conditions, the following definitions apply:

- (1) ACTIVE OPERATIONS shall mean any activity capable of generating fugitive dust, including, but not limited to, earth-moving activities, construction/demolition activities, or heavy- and light-duty vehicular movement.
- (2) CHEMICAL STABILIZERS mean any non-toxic chemical dust suppressant which must not be used if prohibited for use by the Regional Water Quality Control Boards, the California Air Resources Board, the U.S. Environmental Protection Agency (U.S. EPA), or any applicable law, rule or regulation; and should meet any specifications, criteria, or tests required by any federal, state, or local water agency. Unless otherwise indicated, the use of a non-toxic chemical stabilizer shall be of sufficient concentration and application frequency to maintain a stabilized surface.
- (3) CONSTRUCTION / DEMOLITION ACTIVITIES are any on-site mechanical activities preparatory to or related to the building, alteration, rehabilitation, demolition or improvement of property, including, but not limited to the following activities; grading, excavation, loading, crushing, cutting, planing, shaping or ground breaking.
- (4) DISTURBED SURFACE AREA means a portion of the earth's surface which has been physically moved, uncovered, destabilized, or otherwise modified from its undisturbed natural soil condition, thereby increasing the potential for emission of fugitive dust.
- (5) DUST SUPPRESSANTS are water, hygroscopic materials, or non-toxic chemical stabilizers used as a treatment material to reduce fugitive dust emissions.
- (6) EARTH-MOVING ACTIVITIES shall include, but not be limited to, grading, earth cutting and filling operations, loading or unloading of dirt or bulk materials, adding to

or removing from open storage piles of bulk materials, landfill operations, or soil mulching.

(7) FUGITIVE DUST means any solid particulate matter that becomes airborne, other than that emitted from an exhaust stack, directly or indirectly as a result of the activities of man.

(8) INACTIVE DISTURBED SURFACE AREA means any disturbed surface area upon which active operations have not occurred or are not expected to occur for a period of ten consecutive days.

(9) STABILIZED SURFACE means:

(A) any disturbed surface area or open storage pile which is resistant to wind-driven fugitive dust;

(B) any unpaved road surface in which any fugitive dust plume emanating from vehicular traffic does not exceed 20 percent opacity.

(10) VISIBLE ROADWAY DUST means any sand, soil, dirt, or other solid particulate matter which is visible upon paved road surfaces and which can be removed by a vacuum sweeper or a broom sweeper under normal operating conditions.

AQ48. The project owner shall implement a CEC CPM approved fugitive Dust Control Plan during the construction phase of the project.

The plan shall include the following:

1. A description of each of the active operation(s) which may result in the generation of fugitive dust;
2. an identification of all sources of fugitive dust (e.g., earth-moving, storage piles, vehicular traffic, etc.
3. A description of the Best Available Fugitive Dust Control Measures (see Table 1 attached) to be applied to each of the sources of dust emissions identified above (including those required in AQ-2 below). The description must be sufficiently detailed to demonstrate that the applicable best available control measure(s) will be utilized and/or installed during all periods of active operations;
4. In the event that there are special technical (e.g., non-economic) circumstances, including safety, which prevent the use of at least one of the required control measures for any of the sources identified, a justification statement must be provided to explain the reason(s) why the required control measures cannot be implemented.

Verification: Not later than sixty (60) days prior to the commencement of construction, the project owner shall submit the plan to the CEC CPM for review and approval. The project owner shall maintain daily records to document the

specific actions taken pursuant to the plan. A summary of the monthly activities shall be submitted to the CPM via the Monthly Compliance Report.

AQ49. During the construction phase of the project, the project owner shall:

1. Prevent or remove within one hour the track-out of bulk material onto public paved roadways as a result of their operations, or take at least one of the actions listed in Table 2 (attached) to prevent the track-out of bulk material onto public paved roadways as a result of their operations and remove such material at anytime track-out extends for a cumulative distance of greater than 50 feet on to any paved public road during active operations;
2. Install and use a track-out control device to prevent the track-out of bulk material from areas containing soils requiring corrective action (as currently identified in drawing no. 5-1 of the addendum dated February 12, 1999 to the Corrective Measures Study performed by the Mark Group for USS-POSCO Industries) to other areas within the project construction site and lay-down area;
3. Minimize fugitive particulate emissions from vehicular traffic on paved roads and paved parking lots on the construction site by vacuum mechanical sweeping or water flushing of the road surface to remove buildup of loose material. The project owner shall inspect on a daily basis the conditions of the paved roads and parking lots to determine the need for mechanical sweeping or water flushing.

Verification: The project owner shall maintain a daily log during the construction phase of the project indicating: 1) the manner in which compliance with AQ-2 is achieved and 2) the date and time when the inspection of paved roads and parking lots occurs and the date and time(s) when the cleaning operation occurs. The logs shall be made available to the CEC CPM upon request.

AQ50 At any time when fugitive dust from Metcalf Energy Center project construction is visible in the atmosphere beyond the property line, the project owner will identify the source of the fugitive dust and implement one or more of the appropriate control measures specified in Table 3 (attached)

Verification: The project owner will maintain a daily log recording the dates and times that measures in Table 3 (attached) have been implemented and make them available to the CEC CPM upon request.

TABLE 1
BEST AVAILABLE FUGITIVE DUST CONTROL MEASURES

<u>FUGITIVE DUST SOURCE CATEGORY</u>	<u>CONTROL ACTIONS</u>
Earth-moving (except construction cutting and filling areas, and mining operations)	Maintain soil moisture content at a minimum of 12 percent, as determined by ASTM method D-2216, or other equivalent method approved by the CEC CPM. Two soil moisture evaluations must be conducted during the first three hours of active operations during a calendar day, and two such evaluations each subsequent four-hour period of active operations; OR
	For any earth-moving which is more than 100 feet from all property lines, conduct watering as necessary to prevent visible dust emissions from exceeding 100 feet in length in any direction.
Earth-moving: Construction fill areas:	Maintain soil moisture content at a minimum of 12 percent, as determined by ASTM method D-2216, or other equivalent method approved by the CEC CPM. For areas which have an optimum moisture content for compaction of less than 12 percent, as determined by ASTM Method 1557 or other equivalent method approved by the CEC CPM, complete the compaction process as expeditiously as possible after achieving at least 70 percent of the optimum soil moisture content. Two soil moisture evaluations must be conducted during the first three hours of active operations during a calendar day, and two such evaluations during each subsequent four-hour period of active operations.

TABLE 1 (Continued)

<u>FUGITIVE DUST SOURCE CATEGORY</u>	<u>CONTROL ACTIONS</u>
Earth-moving: Construction cut areas and mining operations:	Conduct watering as necessary to prevent visible emissions from extending more than 100 feet beyond the active cut or mining area unless the area is inaccessible to watering vehicles due to slope conditions or other safety factors.
Disturbed surface areas (except completed grading areas)	Apply dust suppression in sufficient quantity and frequency to maintain a stabilized surface. Any areas which cannot be stabilized, as evidenced by wind driven fugitive dust must have an application of water at least twice per day to at least 80 percent of the unstabilized area.
Disturbed surface areas: Completed grading areas	Apply chemical stabilizers within five working days of grading completion; OR
	Take actions (3a) or (3c) specified for inactive disturbed surface areas.
Inactive disturbed surface areas	Apply water to at least 80 percent of all inactive disturbed surface areas on a daily basis when there is evidence of wind driven fugitive dust, excluding any areas which are inaccessible to watering vehicles due to excessive slope or other safety conditions; OR
	Apply dust suppressants in sufficient quantity and frequency to maintain a stabilized surface; OR
	Establish a vegetative ground cover within 21 days after active operations have ceased. Ground cover must be of sufficient density to expose less than 30 percent of unstabilized ground within 90 days of planting, and at all times thereafter; OR
	Utilize any combination of control actions (3a), (3b), and (3c) such that, in total, these actions apply to all inactive disturbed surface areas.

TABLE 1 (Continued)

<u>FUGITIVE DUST SOURCE CATEGORY</u>	<u>CONTROL ACTIONS</u>
Unpaved Roads	Water all roads used for any vehicular traffic at least once per every two hours of active operations; OR
	Water all roads used for any vehicular traffic once daily and restrict vehicle speeds to 15 miles per hour; OR
	Apply a chemical stabilizer to all unpaved road surfaces in sufficient quantity and frequency to maintain a stabilized surface.
Open storage piles	Apply chemical stabilizers; OR
	Apply water to at least 80 percent of the surface area of all open storage piles on a daily basis when there is evidence of wind driven fugitive dust; OR
	Install temporary coverings; OR
	Install a three-sided enclosure with walls with no more than 50 percent porosity which extend, at a minimum, to the top of the pile.
<u>All Categories</u>	Any other control measures approved by the CEC CPM as equivalent to the methods specified in Table 1 may be used.

**TABLE 2
TRACK-OUT CONTROL OPTIONS**

(1)	Pave or apply chemical stabilization at sufficient concentration and frequency to maintain a stabilized surface starting from the point of intersection with the public paved surface, and extending for a centerline distance of at least 100 feet and a width of at least 20 feet.
(2)	Pave from the point of intersection with the public paved road surface, and extending for a centerline distance of at least 25 feet and a width of at least 20 feet, and install a track-out control device immediately adjacent to the paved surface such that exiting vehicles do not travel on any unpaved road surface after passing through the track-out control device.
(3)	Any other control measures approved by the CEC CPM as equivalent to the methods specified in Table 2 may be used.

TABLE 3
CONTROL MEASURES FOR WIND CONDITIONS EXCEEDING 25 MPH

FUGITIVE DUST SOURCE CATEGORY	CONTROL MEASURES
Earth-moving	Cease all active operations; OR
	Apply water to soil not more than 15 minutes prior to moving such soil.
Disturbed surface areas	On the last day of active operations prior to a weekend, holiday, or any other period when active operations will not occur for not more than four consecutive days: apply water with a mixture of chemical stabilizer diluted to not less than 1/20 of the concentration required to maintain a stabilized surface for a period of six months; OR
	Apply chemical stabilizers prior to wind event; OR
	Apply water to all unstabilized disturbed areas 3 times per day. If there is any evidence of wind driven fugitive dust, watering frequency is increased to a minimum of four times per day; OR
	Take the actions specified in Table 1, Item (3c); OR
	Utilize any combination of control actions (1B), (2B), and (3B) such that, in total, these actions apply to all disturbed surface areas.
Unpaved roads	Apply chemical stabilizers prior to wind event; OR
	Apply water twice [once] per hour during active operation; OR
	Stop all vehicular traffic.
Open storage piles	Apply water twice [once] per hour; OR
	Install temporary coverings.
Paved road track-out	Cover all haul vehicles; OR
	Comply with the vehicle freeboard requirements of Section 23114 of the California Vehicle Code for both public and private roads.
All Categories	Any other control measures approved by the Executive Officer and the U.S. EPA as equivalent to the methods specified in Table 3 may be used.

AQ51. To fully mitigate PM10 emissions and prior to the start of construction, the Metcalf Energy Center owner/operator must surrender to the Bay Area Air Quality Management District valid ERC certificates for PM10 for the amount of 29.21 tons per year and for VOC for the amount of 124.2 tons per year from the following sources :

- Folgers Coffee in San Jose (Certificate # 413) for the amount of 7.7 tons/year of PM10 emissions;
- Frito Lay in San Jose (Certificate # 426) for the amount of 7.64 tons/year of PM10 emissions;
- Glorietta Food in San Jose (Certificate # 19) for the amount of 1.54 tons/year of PM10 emissions;
- Raisch Products in Mountainview (Certificate # 507) for the amount of 12.33 tons/year of PM10 emissions;
- Quebecor Facility in San Jose (Certificate # 625) for the amount of 124.2 tons/year of VOC emissions.

This portion of required PM10 ERCs and VOC ERCs and offsets are to be provided in addition to the requirements of condition 41.

Verification: At least 30 days prior to the start of construction, the project owner must submit a copy of the required ERC certificates to the CPM and the District.

AQ52. The project owner shall ensure that all heavy earthmoving equipment including, but not limited to, bulldozers, backhoes, compactors, loaders, motor graders and trenchers, and cranes, dump trucks and other heavy duty construction related trucks, have been properly maintained and the engines tuned to the engine manufacturer's specifications. The project owner shall also install oxidizing soot filters on all suitable construction equipment used either on the power plant construction site or associated linear construction sites. Suitability is to be determined by an independent California Licensed Mechanical Engineer who will stamp and submit for approval an initial and all subsequent Suitability Reports as necessary containing at a minimum the following:

Initial Suitability Report:

- The initial suitability report shall be submitted to the CPM for approval 60 days prior to breaking ground on the project site.
- A list of all fuel burning, construction related equipment used,
- a determination of the suitability of each piece of equipment to work appropriately with an oxidizing soot filter,
- if a piece of equipment is determined to be suitable, a statement by the independent California Licensed Mechanical Engineer that the oxidizing soot filter has been installed and is functioning properly, and
- if a piece of equipment is determined to be unsuitable, an explanation by the independent California Licensed Mechanical Engineer as to the cause of this determination.

Subsequent Suitability Reports:

- If a piece of construction related equipment is subsequently determined to be unsuitable for an oxidizing soot filter after such installation has occurred, the filter may be removed immediately. However notification must be sent to the

CPM for approval containing an explanation for the change in suitability within 10 days.

- Changes in suitability are restricted to three explanations which must be identified in any subsequent suitability report.
- The oxidizing soot filter is reducing normal availability of the construction equipment due to increased downtime, and/or power output due to increased back pressure by 20% or more.
- The oxidizing soot filter is causing or reasonably expected to cause significant damage to the construction equipment engine.
- The oxidizing soot filter is causing or reasonably expected to cause a significant risk to nearby workers or the public.

Verification: The project owner shall submit to the CPM, via the Monthly Compliance Report, documentation, which demonstrates that the contractor's heavy earthmoving equipment is properly maintained and the engines are tuned to the manufacturer's specifications. The project owner shall maintain all records on the site for six months following the start of commercial operation. The project owner will submit to the CPM for approval, the initial suitability report stamped by an independent California Licensed Mechanical Engineer, 60 days prior to breaking ground on the project site. The project owner will submit to the CPM for approval, subsequent suitability reports as required, stamped by an independent California Licensed Mechanical Engineer no later than 10 working day following a change in the suitability status of any construction equipment.

AQ53. The heat input to the fire pump diesel engine resulting from maintenance and testing activities shall not exceed 211 MM BTU totaled over any consecutive twelve month period. (TRMP)

Verification: As part of the monthly Air Quality Reports, the owner/operator shall indicate the date of any violation of this Condition including quantitative information on the severity of the violation.

AQ54. The total hours of operation of the emergency generator shall not exceed 200 hours per calendar year, plus an additional 100 hours per calendar year for the purposes of maintenance and testing. (Regulation 2-1-114.2.3.1)

Verification: As part of the monthly Air Quality Reports, the owner/operator shall indicate the date of any violation of this Condition including quantitative information on the severity of the violation.

REFERENCES

- Calpine/Bechtel. 1999a. Application for Certification, Metcalf Energy Center (99-AFC-3). Submitted to the California Energy Commission, April 30, 1999.
- Calpine/Bechtel. 1999b. Various confidential filings-paleontological resources, cultural resources, air quality dated April 30, May 19, May 20, and August 23, 1999.
- Calpine/Bechtel. 1999c. Data Adequacy Supplement #1, dated June 7, 1999.
- Calpine/Bechtel. 1999e. AFC Supplement A, October 1, 1999.
- Calpine/Bechtel. 1999f. AFC Supplement B, October 15, 1999.
- Calpine/Bechtel. 1999h. Set 1a data responses to CEC data requests submitted to the California Energy Commission on August 23, 1999.
- Calpine/Bechtel. 1999i. Set 1b data responses to CEC data requests submitted to the California Energy Commission on August 27, 1999.
- Calpine/Bechtel. 1999o. Application to the Bay Area Air Quality Management District for a determination of Compliance dated June 14, 1999.
- Calpine/Bechtel. 1999p. Set 2a data responses dated October 15, 1999, docketed on October 18, 1999.
- Calpine/Bechtel. 2000b. AFC Supplement C, February 15, 2000.
- United States Environmental Protection Agency. Region IX. Letter dated March 24, 2000, to all the all Air Quality Management Districts.
- Chow, J. C., D. Fairley, J. Watson, R. DeMandel, E. Fujita, D. Lowenthal, Z. Lu, C. Frazier, G. Long, J. Cordova (1995). "Source Apportionment of Wintertime PM10 at San Jose, Calif." *Journal of Environmental Engineering*, 378-387. May.
- Calpine/Bechtel. 2000. Data responses dated August 22, 2000, docketed on August 22, 2000.

APPENDIX A

Copy of the BAAQMD's best Available Control Technology (BACT) Guideline

PUBLIC HEALTH

Testimony of Michael Ringer

INTRODUCTION

The purpose of staff's public health analysis is to determine if toxic emissions from the proposed Metcalf Energy Center (MEC) will have the potential to cause significant adverse public health impacts or to violate standards for public health protection. If potentially significant health impacts are identified, staff will evaluate mitigation measures to reduce such impacts to insignificant levels.

Staff addresses potential impacts of regulated or criteria air pollutants in the **Air Quality** section (please see **Public Health** Attachment A for a discussion of the health effects of criteria pollutants). Impacts on public and worker health from accidental releases of hazardous materials are examined in the **Hazardous Materials Management** section. Health effects from electromagnetic fields are discussed in the **Transmission Line Safety and Nuisance** section. Pollutants released from the project in wastewater streams to the public sewer system are discussed in the **Soils and Water Resources** section. Plant releases in the form of hazardous and nonhazardous wastes are described in the **Waste Management** section.

METHOD OF ANALYSIS

Public health staff is concerned about toxic emissions to which the public could be exposed during project construction and routine operation. Following the release of toxic contaminants into the air or water, people may come into contact with them through inhalation, dermal contact, or ingestion via contaminated food or water.

Air pollutants for which no air quality standards have been set are called noncriteria pollutants. Unlike criteria pollutants such as ozone, carbon monoxide, sulfur dioxide, or nitrogen dioxide, noncriteria pollutants have no ambient (outdoor) air quality standards that specify levels considered safe for everyone.

Since noncriteria pollutants do not have such standards, a process known as health risk assessment is used to determine if people might be exposed to those types of pollutants at unhealthy levels. The risk assessment procedure consists of the following steps:

1. Identify the types and amounts of hazardous substances that the MEC project could emit to the environment;
2. Estimate worst-case concentrations of project emissions in the environment using dispersion modeling;
3. Estimate amounts of pollutants to which people could be exposed through inhalation, ingestion, and dermal contact; and

4. Characterize potential health risks by comparing worst-case exposure to safe standards based on known health effects.

Initially, a screening level risk assessment is performed using simplified assumptions that are intentionally biased toward protection of public health. That is, an analysis is designed that overestimates public health impacts from exposure to project emissions. In reality, it is likely that the actual risks from the power plant will be much lower than the risks which are estimated by the screening level assessment. This is accomplished by examining conditions that would lead to the highest, or worst-case risks, and then using those in the study. Such conditions include:

- Using the highest levels of pollutants that could be emitted from the plant;
- Assuming weather conditions that would lead to the maximum ambient concentration of pollutants;
- Using the type of air quality computer model which predicts the greatest plausible impacts;
- Calculating health risks at the location where the pollutant concentrations are calculated to be the highest;
- Using health-based standards designed to protect the most sensitive members of the population (i.e., the young, elderly, and those with respiratory illnesses); and
- Assuming that an individual's exposure to cancer-causing agents occurs for 70 years.

A screening level risk assessment will, at a minimum, include the potential health effects from inhaling hazardous substances. Some facilities may also emit certain substances which could present a health hazard from noninhalation pathways of exposure (see CAPCOA 1993, Table III-5). When these substances are present in facility emissions, the screening level analysis includes the following additional exposure pathways: soil ingestion, dermal exposure, and mother's milk (CAPCOA 1993, p. III-19).

The risk assessment process addresses three categories of health impacts: acute (short-term) health effects, chronic (long-term) noncancer effects, and cancer risk (also long-term). Acute health effects result from short-term (1-hour) exposure to relatively high concentrations of pollutants. Acute effects are temporary in nature, and include symptoms such as irritation of the eyes, skin, and respiratory tract.

Chronic health effects are those which arise as a result of long term exposure to lower concentrations of pollutants. The exposure period is considered to be approximately from ten to one hundred percent of a lifetime (from seven to seventy years). Chronic health effects include diseases such as reduced lung function and heart disease.

The analysis for noncancer health effects compares the maximum project contaminant levels to safe levels called “reference exposure levels” or RELs. These are amounts of toxic substances to which even sensitive people can be exposed and suffer no adverse health effects (CAPCOA 1993, p. III-36). These exposure levels are designed to protect the most sensitive individuals in the population, such as infants, the aged, and people suffering from illness or disease which makes them more sensitive to the effects of toxic substance exposure. The RELs are based on the most sensitive adverse health effect reported in the medical and toxicological literature, and include margins of safety. The margin of safety addresses uncertainties associated with inconclusive scientific and technical information available at the time of standard setting and is meant to provide a reasonable degree of protection against hazards that research has not yet identified. The margin of safety is designed to prevent pollution levels that have been demonstrated to be harmful, as well as to prevent lower pollutant levels that may pose an unacceptable risk of harm, even if the risk is not precisely identified as to nature or degree. Health protection is achieved if the estimated worst-case exposure is below the relevant reference exposure level. In such a case, an adequate margin of safety exists between the predicted exposure and the estimated threshold dose for toxicity.

Exposure to multiple toxic substances may result in health effects that are equal to, less than, or greater than effects resulting from exposure to the individual chemicals. Only a small fraction of the thousands of potential combinations of chemicals have been tested for the health effects of combined exposures. In conformance with CAPCOA guidelines, the health risk assessment assumes that the effects of each substance are additive for a given organ system (CAPCOA 1993, p. III-37). In those cases where the actions may be synergistic (where the effects are greater than the sum), this approach may underestimate the health impact (Id).

For carcinogenic substances, the health assessment considers the risk of developing cancer and assumes that continuous exposure to the cancer-causing substance occurs over a 70-year lifetime. The risk that is calculated is not meant to project the actual expected incidence of cancer, but rather a theoretical upper-bound number based on worst-case assumptions. In reality, the risk is generally too small to actually be measured. For example, the one in one million risk level represents a one in one million increase in the normal risk of developing cancer over a lifetime, at whatever location is estimated to have the worst-case risk.

Cancer risk is expressed in chances per million, and is a function of the maximum expected pollutant concentration, the probability that a particular pollutant will cause cancer (called “potency factors”, and established by the California Office of Environmental Health Hazard Assessment), and the length of the exposure period. Cancer risks for each carcinogen are added to yield total cancer risk. The conservative nature of the screening assumptions used means that actual cancer risks are likely to be lower or even considerably lower than those estimated.

The screening analysis is performed to assess worst-case risks to public health associated with the proposed project. If the screening analysis predicts no

significant risks, then no further analysis is required. However, if risks are above the significance level, then further analysis, using more realistic site-specific assumptions would be performed to obtain a more accurate assessment of potential public health risks.

SIGNIFICANCE CRITERIA

Commission staff determines the health effects of exposure to toxic emissions based on impacts to the maximum exposed individual. This is a person hypothetically exposed to project emissions at a location where the highest ambient impacts were calculated using worst-case assumptions, as described above.

As described earlier, non-criteria pollutants are evaluated for short-term (acute) and long-term (chronic) noncancer health effects, as well as cancer (long-term) health effects. Significance of project health impacts is determined separately for each of the three categories.

ACUTE AND CHRONIC NONCANCER HEALTH EFFECTS

Staff assesses the significance of non-cancer health effects by calculating a “hazard index”. A hazard index is a ratio comparing exposure from facility emissions to the reference (safe) exposure level. A ratio of less than one signifies that the worst-case exposure is below the safe level. The hazard index for every toxic substance which has the same type of health effect is added to yield a total hazard index. The total hazard index is calculated separately for acute and chronic effects. A total hazard index of less than one indicates that cumulative worst-case exposures are less than the reference exposure levels (safe levels). Under these conditions, health protection is likely to be achieved, even for sensitive members of the population. In such a case, staff presumes that there would be no significant non-cancer project-related public health impacts.

CANCER RISK

Staff presumes that if worst-case toxic emissions from the Metcalf project increase anyone's lifetime cancer risk by one chance in one million (1×10^{-6}) or less, then the added risk is de minimis, or one that is so small, that it is effectively “no risk”. The Federal Food and Drug Administration (FDA) made a similar finding in the context of cancer risks from food additives (FDA 1985, p. 51557). They emphasized that the risk level did not mean that one in every one million people would contract cancer, but that the level represented an additional one in one million chance over a person's normal risk of developing cancer in his or her lifetime. On average, for example, the lifetime risk of someone developing cancer is around 250,000 in a million (about one of every four people will have some type of cancer in their lifetime). At the one in one million risk level, the FDA noted that “as far as can be determined, in all probability no one will contract cancer.” (Id.)

Staff does not believe that mitigation measures to reduce risk to less than one in one million are warranted, since at that level there is effectively no added cancer risk. Similarly, the Bay Area Air Quality Management District (BAAQMD) Risk Management Policy states that a project with an incremental cancer risk of one in one million or less is acceptable without further risk management consideration, and

without further toxics reduction measures (BAAQMD 2000a, p. 4). Further, a survey of 132 regulatory decisions found that, with the exception of one decision, no action was taken to reduce risks below one in a million (Travis et al., 1987).

Staff does not view project-related cancer risks as significant at the de minimus level discussed above, since there is essentially no added risk. Therefore, staff must identify an appropriate level of risk on which to base determinations of significance. Staff relied upon regulations implementing the provisions of Proposition 65, the Safe Drinking Water and Toxic Enforcement Act of 1986 (Health & Safety Code, §§ 25249.5 et seq.) for guidance to determine a risk significance level. Title 22, California Code of Regulations, § 12703(b) states that “the risk level which represents no significant risk shall be one which is calculated to result in one excess case of cancer in an exposed population of 100,000, assuming lifetime exposure.” This level of risk is equivalent to a cancer risk of ten in one million, or 10×10^{-6} . An important distinction is that the Proposition 65 significance level applies separately to each cancer-causing substance, whereas staff determines significance based on the total risk from all cancer-causing chemicals. Thus, the manner in which the significance level is applied by staff is more conservative (health-protective) than that which applies to Proposition 65.

The significant risk level of ten in one million is consistent with the level of significance adopted by the BAAQMD Board of Directors pursuant to Health and Safety Code § 44362(b), which requires notification of nearby residents when an air district determines that there is a significant health risk from a facility. In addition, BAAQMD’s Risk Management Policy states that a project with an incremental cancer risk of between one and ten in a million is acceptable if best available control technology has been applied to reduce risk (BAAQMD 2000a, p. 4). In general, BAAQMD would not approve a project with a cancer risk exceeding ten in one million.

As noted earlier, the initial risk analysis for a project is typically performed at a screening level, which is designed to overstate actual risks, so that health protection can be ensured. When a screening analysis shows cancer risks to be above the significance level, refined assumptions would likely result in a lower, more realistic risk estimate. If facility risk, based on refined assumptions, exceeds the significance level of ten in one million, staff would require appropriate measures to reduce risk to less than significant. If, after all risk reduction measures had been considered, a refined analysis identifies a cancer risk greater than ten in one million, staff would deem such risk to be significant, and would not recommend project approval.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

The following federal, state, and local LORS generally apply to the protection of public health. These provisions have established the basis for Energy Commission staff’s determination regarding the significance and acceptability of project-related impacts on public health.

FEDERAL

CLEAN AIR ACT SECTION 112 (42 U.S. CODE SECTION 7412)

Section 112 requires new sources which emit more than ten tons per year of any specified hazardous air pollutant (HAP) or more than 25 tons per year of any combination of HAPs to apply Maximum Achievable Control Technology (MACT).

STATE

CALIFORNIA HEALTH AND SAFETY CODE SECTIONS 39650 ET SEQ.

These sections mandate the Air Resources Board and the Department of Health Services to establish safe exposure limits for toxic air pollutants and identify pertinent best available control technologies. They also require that the new source review rule for each air pollution control district include regulations that require new or modified procedures for controlling the emission of toxic air contaminants.

CALIFORNIA HEALTH AND SAFETY CODE SECTION 41700

This section states that “no person shall discharge from any source whatsoever such quantities of air contaminants or other material which cause injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause, or have a natural tendency to cause injury or damage to business or property.”

LOCAL

BAY AREA AIR QUALITY MANAGEMENT DISTRICT RULE 2-1-316

This rule requires a risk assessment or risk screening analysis to be performed for new or modified facilities that emit one or more toxic air contaminants that exceed specified amounts.

SAN JOSE NORTH COYOTE VALLEY CAMPUS INDUSTRIAL AREA MASTER DEVELOPMENT PLAN

The Master Development Plan contains Environmental Performance Standards. Section C. 6 (Air Quality) states “No manufacturing operation shall be permitted which produces odors, fumes, smoke, or other air-borne pollutants detectable, without instruments, at the property lines of the subject parcel or which produces any dangerous emissions whatsoever.”

SETTING

This section describes the environment in the vicinity of the proposed project site from the public health perspective. Features of the natural environment, such as meteorology and terrain, affect the project's potential for causing impacts on public health. An emissions plume from a facility may affect elevated areas before lower terrain areas, due to a reduced opportunity for atmospheric mixing. Consequently, areas of elevated terrain can often be subjected to increased pollutant impacts. Also, the types of land use near a site influence the surrounding population distribution and density which, in turn, affects public exposure to project emissions. Additional factors affecting potential public health impact include existing air quality and environmental site contamination.

SITE AND VICINITY DESCRIPTION

The proposed site is located on approximately 14 acres in the northern end of North Coyote Valley, separated from urban San Jose by Tulare Hill. The site topography is relatively flat, with an elevation about 252 feet above sea level, on the floor of the Santa Clara Valley. In the vicinity of the proposed site, the Santa Clara Valley is less than a mile wide and bounded by the Santa Teresa Hills (elevation 1,100 feet) on the west-southwest. Other ridges of the Coastal Range, with maximum elevations of about 1,300 feet, bound the Valley on the northeast. Northwest of the site, the Santa Clara Valley opens into a basin which extends to San Francisco Bay and contains San Jose and its suburbs.

Currently, land at the proposed site is classified as prime agricultural. Existing land uses on the property include old vehicle storage, disposal of construction debris, and some agriculture. Surrounding land is generally undeveloped, with vacant land to the northeast, agricultural land to the north and west, and an electric substation to the east. The Coyote Valley Urban Reserve is located about two miles south of the MEC site. Currently agricultural, future development there is expected to include an independent community with jobs, housing (up to 20,000 to 25,000 dwelling units), commercial facilities, schools, parks, and public transit. Just south of the MEC site lies the 1,444 acre North Coyote Valley Campus Industrial Area, within which is a planned development of 6.6 million square feet of building space to be occupied by a work force of about 19,800 employees. About one mile north of the proposed site, a residential development of 131 single family homes is planned north of Metcalf Road and east of Highway 101.

As mentioned above, the location of sensitive receptors near the proposed site is an important factor in considering potential public health impacts. The nearest residence is on the west side of Monterey Road, about 1,150 feet away (south-southeast of the proposed site). On the east side of Monterey Road, there is a residence about 2,050 feet away. A residential area is located about three-quarters of a mile to the northwest. The nearest schools are located about 6,000 feet (1.1 miles) to the west northwest, and 7,500 feet (1.4 miles) to the southeast. AFC Figures 8.12-1a and 1b show sensitive receptors within a three mile radius of the project site, and descriptions of the receptors are presented in AFC Table 8.12-1.

Included in the Coyote Valley Research Park planned development is a day care facility that would serve up to 700 children, housed in one to three buildings on six to eight acres.

METEOROLOGY

Meteorological conditions, including wind speed, wind direction, and atmospheric stability, affect the extent to which pollutants are dispersed into ambient air as well as the direction of pollutant transport. This, in turn, affects the level of public exposure to emitted pollutants and associated health risks. When wind speeds are low and the atmosphere is stable, for example, dispersion is reduced and localized exposure may be increased.

The climate at the project site is dominated by the influence of the Pacific Ocean and the Pacific high-pressure system, which is a semi-permanent, subtropical high-pressure system located off the coast. The size and strength of the Pacific high is at a maximum during the summer, when it is at its northernmost position, and results in strong northwesterly air flow and negligible precipitation. During this period, inversions become strong, winds are light, and the pollution potential is high. The Pacific high's influence weakens during the fall and winter when it moves southwestward, which allows storms from the Gulf of Alaska to reach northern California. About 80 percent of the region's annual rainfall occurs between November and March. During the winter, inversions are weak, winds often moderate, and the potential for air pollution is low.

Atmospheric stability is a measure related to turbulence, or the ability of the atmosphere to disperse pollutants due to convective air movement. Mixing heights (the height above ground level through which the air is well mixed and in which pollutants can be dispersed) are lower during mornings due to temperature inversions and increase during the warmer afternoons. Staff's **Air Quality** section presents more detailed meteorological data.

EXISTING AIR QUALITY

The proposed site is within the jurisdiction of BAAQMD, which includes Santa Clara County as well as eight other Bay Area counties. BAAQMD conducts ambient monitoring of thirteen gaseous toxic air contaminants at 17 locations throughout the district. By combining average toxic concentration levels from all monitoring sites with cancer risk factors specific to each contaminant, lifetime cancer risk can be calculated to provide a background risk level for inhalation of ambient air.

In 1998, the background cancer risk calculated by BAAQMD for the Bay area was 199 in one million (BAAQMD 1999, p. 11). The pollutants 1,3-butadiene and benzene, emitted primarily from mobile sources, were the two highest contributors to risk and together accounted for over half of the total. The risk from 1,3-butadiene was about 66 in one million, while the risk from benzene was about 58 in one million. Formaldehyde accounts for about seven percent of the 1998 average calculated cancer risk for the Bay Area, with a risk of about 13 in one million. Formaldehyde is emitted directly from vehicles and other combustion sources, such as the proposed MEC project.

The use of reformulated gasoline, beginning in the second quarter of 1996, as well as other toxics reduction measures, have led to a decrease of ambient levels of toxics and associated cancer risk during the past few years. For example, cancer risk was 342 in one million based on 1992 data, 315 in one million based on 1994 data, and 303 in one million based on 1995 data.

The toxic air monitoring station closest to the MEC project is on Fourth Street in San Jose. The 1997 ambient levels of the two pollutants which contribute most to ambient risk (1,3-butadiene and benzene) were significantly higher at that station than the Bay area average, probably due to mobile sources. In 1997, cancer risks in San Jose for 1,3-butadiene and benzene were about 162 and 78 in one million, respectively, compared to the Bay area average of 58 and 54 in one million. However, 1998 data show that concentrations of 1,3-butadiene were lower in San Jose than the Bay area average, while benzene levels were only marginally higher. In 1998, cancer risk for 1,3-butadiene was 51 in one million in San Jose compared to 66 for the Bay area, while risk for benzene was 63 in one million in San Jose compared to 58 in the Bay area.

SITE CONTAMINATION

Site disturbances will occur during facility construction from excavation, grading, and earth moving. Such activities have the potential to adversely affect public health through various mechanisms, such as the creation of airborne dust, material being carried off-site through soil erosion, and uncovering buried hazardous substances.

On behalf of Calpine Corporation and Bechtel Enterprises, Phase I and II Environmental Site Assessments (ESA) were conducted by Environmental Resources Management (ERM) in accordance with American Society for Testing and Materials Standard E 1527-97, Standard Practice for Environmental Site Assessments (ERM 1999). The purpose of an ESA is to determine the potential for the presence or likely presence of any hazardous substances or petroleum products under conditions that may indicate a release or threat of a release from present or past activities. The results of the ESAs are summarized in staff's **Waste Management** section. In addition, a database search was performed for potentially contaminated sites which may be encountered during construction of the linear facilities. These results are also summarized in the **Waste Management** section.

IMPACTS

PROJECT SPECIFIC IMPACTS

Potential risks to public health may occur during both project construction and operation.

CONSTRUCTION IMPACTS

Potential risks to public health during construction may be associated with exposure to toxic substances in contaminated soil disturbed during site preparation, as well as from heavy equipment operation. Criteria pollutant impacts from the operation of heavy equipment and particulate matter from earth moving are examined in staff's **Air Quality** analysis.

As described in the **Waste Management** section, Phase I and II Environmental Site Assessments (ESAs) have been performed. The ESAs have shown no evidence of significant site contamination, although certain areas were inaccessible during sampling efforts and will be required to be characterized further prior to facility construction, if it is approved.

The **Waste Management** section also discusses potentially contaminated sites which may be encountered during construction of the linear facilities. Of 28 leaking underground storage tanks within 250 feet of either side of the linear facilities, twelve are still under oversight by the Santa Clara Valley Water District for potential groundwater contamination. Contaminated soil or groundwater is likely to exist at the listed sites, but the extent of contamination is not indicated. As noted in the **Waste Management** section, MEC has proposed procedures to assure proper management of soil that might be contaminated when construction occurs in areas near suspected contamination (MEC 1999b, p. 93).

The operation of construction equipment will result in air emissions from diesel-fueled engines. Although diesel exhaust contains criteria pollutants such as nitrogen oxides, carbon monoxide, and sulfur oxides, it also includes a complex mixture of thousands of gases and fine particles. These particles are primarily composed of aggregates of spherical carbon particles coated with organic and inorganic substances. Diesel exhaust contains over 40 substances that are listed by the U.S. EPA as hazardous air pollutants and by the Air Resources Board (ARB) as toxic air contaminants. Because of the many constituents in diesel exhaust as well as evidence that the particles themselves may have intrinsic toxic and carcinogenic properties, many researchers have used the particles to quantify exposure to whole diesel exhaust.

Exposure to diesel exhaust causes both short- and long-term adverse health effects. Short-term effects can include increased cough, labored breathing, chest tightness, wheezing, and eye and nasal irritation. Long-term effects can include increased coughing, chronic bronchitis, reductions in lung function, and inflammation of the lung. Epidemiological studies also strongly suggest a causal relationship between occupational diesel exhaust exposure and lung cancer.

Based on a number of health effects studies, the Scientific Review Panel on Toxic Air Contaminants (SRP) recommended a chronic REL (see REL discussion in **Method of Analysis** section above) for diesel exhaust particulate matter of 5 mg/m^3 and a cancer unit risk factor of $3 \times 10^{-4} (\text{mg/m}^3)^{-1}$ (SRP 1998, p. 6). The SRP did not recommend a value for an acute REL, since available data in support of a value was deemed insufficient. On August 27, 1998, the ARB listed particulate emissions

from diesel-fueled engines as a toxic air contaminant and approved SRP's recommendations regarding health effect levels.

Construction of MEC is anticipated to take place over a period of twenty months. As noted earlier, assessment of chronic (long-term) health effects assumes continuous exposure to toxic substances over a significantly longer time period, typically from seven to seventy years. Thus, only acute health effects, which occur after a one hour exposure period, are examined here. Since the SRP did not recommend an acute REL for diesel exhaust particulate matter, an acute hazard index cannot be calculated. However, acute RELs are usually at least ten times the chronic REL for the same chemical. Therefore, multiplying the chronic REL by a factor of ten could be considered a conservative, or health protective method of deriving a level for general comparison purposes. This yields a value of 50 $\mu\text{g}/\text{m}^3$.

AFC Appendix 8.1E presents exhaust emissions from construction activities. Diesel emissions are generated from sources such as trucks, graders, cranes, welding machines, electric generators, air compressors, and water pumps. Worst-case daily exhaust emissions of 9.18 lb/day PM10 are expected to occur in month 15, in the middle of the construction schedule during the installation of major mechanical equipment (Calpine/Bechtel 1999a, AFC Appendix 8.1E, p. 8E-1). Calpine/Bechtel estimates that about 86 percent, or 7.92 lb/day of these emissions are from diesel-powered equipment (Calpine/Bechtel 2000c, p. 3). Modeling construction activities, which are assumed to occur for eight hours per day, gives a one-hour maximum concentration of 81.79 $\mu\text{g}/\text{m}^3$ near the northern fenceline of the project (Calpine/Bechtel 2000c, p. 3 and Figure PH2-1). Areas where the one-hour concentrations are predicted to exceed the 50 $\mu\text{g}/\text{m}^3$ level derived above are the uninhabited areas north and east of the proposed site. The modeled one-hour concentration at the nearest residential receptor is 46.65 $\mu\text{g}/\text{m}^3$.

OPERATION IMPACTS

EMISSIONS SOURCES

The emissions sources at the proposed MEC project include a fire pump diesel engine, two gas turbines with heat recovery steam generators, one steam turbine with supplemental duct burners, and the cooling tower. During operation, potential public health risks are related to diesel exhaust emissions from testing the diesel engine-driven fire pump engine, natural gas combustion emissions from the gas turbines and duct burners, and noncombustion emissions from the cooling tower.

As noted earlier, the first step in a health risk assessment is to identify potentially toxic compounds that may be emitted from the facility.

Diesel exhaust emissions contain a number of toxic compounds. However, a chronic REL and cancer risk factor have been established for diesel particulate matter which may be used to characterize emissions from diesel engines (please see the above discussion under **Construction Impacts**). The diesel engine used for the fire pump must be tested on a weekly basis in accordance with safety requirements, resulting in diesel particulate emissions that must be analyzed for

health effects. The BAAQMD Risk Management Policy for Diesel Engines (established February 3, 2000) lists criteria for permitting stationary diesel engines, and states that if the annual emissions would result in an incremental cancer risk equal to or less than one in one million (measured at the point of maximum residential or off-site worker exposure) over an exposure period of 70 years, the project is acceptable without further risk management considerations.

Supplement C Table 3.1-5 of the AFC lists noncriteria pollutants that may be emitted from MEC project turbines as combustion byproducts, along with their anticipated amounts (emission factors). Emission factors are from data compiled by the Ventura County Air Pollution Control District and from the California Air Toxics Emission Factors (CATEF) database. Tables 8.6-2 and PH-63-1 of the AFC (Calpine/Bechtel 1999j, data response # 63) list toxicity values used to characterize cancer and noncancer health impacts from project pollutants. The toxicity values include reference exposure levels, which are used to calculate short-term and long-term noncancer health effects, and cancer unit risks, which are used to calculate the lifetime risk of developing cancer, as published in the CAPCOA Guidelines (CAPCOA 1993). **PUBLIC HEALTH** Table 1 lists combustion-related toxic emissions and shows how each contributes to the health risk analysis. For example, the first row shows that oral exposure to acetaldehyde is not of concern, but if inhaled, may have cancer and chronic (long-term) noncancer health effects, but not acute (short-term) effects.

PUBLIC HEALTH Table 1
Types of Health Impacts and Exposure Routes Attributed to Combustion-Related Toxic Emissions

Substance	Oral Cancer	Oral Noncancer	Inhalation Cancer	Noncancer (Chronic)	Noncancer (Acute)
Acetaldehyde			✓	✓	
Acrolein				✓	✓
Ammonia				✓	✓
Benzene			✓	✓	
1,3-Butadiene			✓		
Formaldehyde			✓	✓	✓
Napthalene		✓		✓	
PAHs	✓		✓		
Propylene oxide			✓	✓	✓
Toluene				✓	
Xylene				✓	✓

Source: AFC Table 8.1-18 using reference exposure levels and cancer unit risks from CAPCOA Air Toxics "Hot Spots" Program Revised 1992 Risk Assessment Guidelines, October 1993

Noncriteria emissions from the cooling tower originate from contaminants in the cooling source water that become entrained in liquid water droplets emitted as cooling tower drift. MEC will use treated wastewater from the South Bay Water

Recycling (SBWR) Program for cooling. AFC Table 8.14-2 lists constituents found in SBWR wastewater which could be emitted as part of the drift. AFC Appendix 8.1, Table 8.1A-3 lists the amounts of each pollutant released to the atmosphere in the cooling tower drift based on the pollutant levels in the circulating cooling water. **PUBLIC HEALTH** Table 2 lists these substances and shows how each contributes to the health risk analysis.

PUBLIC HEALTH Table 2
Types of Health Impacts and Exposure Routes
Attributed to Cooling Tower Emissions

Substance	Oral Cancer	Oral Noncancer	Inhalation Cancer	Chronic Noncancer	Acute Noncancer
Ammonia				✓	✓
Arsenic	✓	✓	✓	✓	
Cadmium		✓	✓	✓	
Copper				✓	
Lead		✓	✓	✓	
Mercury		✓			✓
Nickel			✓	✓	✓
Zinc				✓	

Source: AFC Appendix Table 8.1A-3 using reference exposure levels and cancer unit risks from CAPCOA Air Toxics "Hot Spots" Program Revised 1992 Risk Assessment Guidelines, October 1993

In addition to the substances identified in **PUBLIC HEALTH** Table 2, there has been public concern that viruses and bacteria could remain in treated wastewater, and that they could be released to the atmosphere in the cooling tower drift at levels that could affect public health.

The California Department of Health Services (DHS) is proposing to regulate the use of recycled water in cooling towers under Title 22 of the California Code of Regulations (proposed section 60306). When recycled water is used in a cooling tower that creates a mist, the regulations would require the following:

- The recycled water used must be disinfected tertiary recycled water (DTRW).
- A drift eliminator shall be used whenever the cooling system is in operation.
- A chlorine, or other biocide, shall be used to treat the recirculating water to minimize the growth of *Legionella* and other micro-organisms.

Disinfected Tertiary Recycled Water

The proposed regulations define DTRW as a filtered and subsequently disinfected wastewater and specify the degree of disinfection required or the final allowable concentrations of pathogens (e.g., 99.999 percent reduction of virus and mean concentration of coliform bacteria not exceeding 2.2 per 100 milliliters) (section 60301.230). Water meeting these standards is also allowed by the proposed

regulations to be used for irrigating food crops, parks and playgrounds, school yards, and residential landscaping.

As noted above, the source for MEC cooling water will be San Jose's SBWR Program. SBWR water is provided by the San Jose/Santa Clara Water Pollution Control Plant (WPCP), an advanced tertiary treatment facility which produces water treated to the proposed Title 22 standards for unrestricted use. The advanced tertiary treatment facilities include nitrification, filtration, and chlorine disinfection. The WPCP, in accordance with the proposed standards, samples the recycled water daily for various analyses and provides water that routinely surpasses Title 22 standards (e.g., coliform bacteria counts typically less than 1.0 per 100 milliliters, compared to the proposed Title 22 standard of 2.2).

Several studies have examined and confirmed the effectiveness of treatment processes conforming to Title 22 requirements in reducing pathogens to safe levels. The Monterey Wastewater Reclamation Study for Agriculture (spanning eleven years from planning and design in 1975 to final project reporting in 1986) examined the safety of irrigating raw-eaten vegetables with recycled water (Sheikh, et al. 1998a). That study found that aerosols generated from sprinkler irrigation did not contain microorganisms of wastewater origin (Sheikh, et al. 1998a, p. 802). Further, during the five-year period of field studies, no in situ viruses were recovered from the treated effluent comprising 114 samples with a volume of over 186,000 liters (Sheikh, et al. 1998a, p. 803).

A follow-up to the Monterey study was conducted in 1997 to determine if additional water-borne pathogens capable of producing gastrointestinal diseases were present in recycled water (Sheikh, et al. 1998b). This more recent study did not detect any of the bacteria *Salmonella*, *Cyclospora*, *E. coli*, or *Legionella*; or the protozoans *Giardia* or *Cryptosporidium* in the recycled water (Sheikh, et al. 1998b, Table 4, p. 6).

The County Sanitation Districts of Los Angeles County operate seven tertiary filtration plants for water reuse. During a ten-year virus monitoring period from 1979 to 1989, only one virus was isolated from samples testing more than 100,000 gallons of disinfected tertiary effluent (Chen et al. 1998, p. 258).

The water purification process at the WPCP includes chlorine disinfection to reduce the number of pathogens. Some public concern exists regarding the potential for chlorinated reclaimed water to contain toxic byproducts, such as polychlorinated biphenyls (PCBs), dioxins, and chloroform (trihalomethanes). Certain byproducts may form as a result of reactions between chlorine and remaining organic matter in the reclaimed water. Numerous toxicological studies have shown several disinfection byproducts to be carcinogenic in laboratory animals or to cause adverse reproductive or developmental effects.

Reclaimed water from the WPCP is subject to regulatory limits for the above substances, which are set by the San Francisco Bay Regional Water Quality Control Board. In addition, monitoring requirements are also established. For example, the WPCP permit requirements for dioxins and PCBs are 1.4×10^{-8} parts

per billion (ppb) and 14 parts per trillion (ppt), respectively. For perspective, these levels may be compared to the maximum contaminant levels (MCLs - permissible levels of contaminants in water which is delivered to any user of a public water system) established for these substances by U.S. EPA drinking water regulations. The MCL for dioxin is 3×10^{-5} ppb, while the MCL for PCBs is 500 ppt. For these two substances, the permit requirements, as noted above, are substantially lower than the MCLs. For chloroform, test results from the WPCP show that levels under six ppb are routinely achieved, compared to the MCL of 80 ppb. Therefore, staff concludes that disinfection byproduct formation associated with the use of reclaimed water is not a significant health issue.

Drift Eliminators

The MEC project will use high efficiency drift eliminators which limit the amount of drift loss to approximately 0.0005 percent of the circulating water rate, resulting in a drift rate of about 0.7 gallon per minute (Calpine/Bechtel 2000b, Table 8.1A-5). This amount of water lost as liquid from the cooling towers is in contrast to the amount of water evaporated as steam, estimated to be from 1,500 to 2,500 gallons per minute, depending on ambient temperatures (Calpine/Bechtel 1999a, AFC Figures 2.2-6a,b). Steam emitted from the cooling towers is distilled water, and will not contain contaminants.

The drift eliminators must be properly installed and maintained in order to achieve efficient operation over the life of the facility. Following installation, proper maintenance includes periodic inspection and repair or replacement of any components found to be broken or missing. Calpine/Bechtel have proposed language for a Condition of Certification for the inspection and maintenance of drift eliminators. Staff has incorporated this language in proposed Condition of Certification Public Health-1.

Cooling Water Treatment

As noted above, water from the WPCP is disinfected using chlorine to reduce pathogenic organisms. Additional routine water treatment with chlorine at MEC is required during use to minimize bacterial growth, corrosion, and formation of mineral scale. The MEC will employ an automated chemical feed system to supply conditioning chemicals (sulfuric acid, organic phosphate, and sodium hypochlorite) to the cooling water (Calpine/Bechtel 1999a, AFC p. 2-9). The system will continuously monitor several water parameters and provide real time data to the plant operators, as well as alarm enunciation if specified levels are exceeded (Calpine/Bechtel 1999h, data response #66). Such routine water treatment also serves to minimize conditions which are conducive to the growth of pathogenic organisms such as *Legionella* bacteria. These include the presence of other microorganisms which contribute nutritional factors, stagnant water or low flow conditions, the presence of corrosion, scale, and accumulations of sludge and sediment.

EMISSIONS LEVELS

Once potential emissions are identified, the next step is to quantify them by conducting a "worst case" analysis. Maximum hourly emissions are required to

calculate acute (one hour) noncancer health effects, while estimates of maximum emissions on an annual basis are required to calculate cancer and chronic (long-term) noncancer health effects.

The diesel fire pump will be powered by a 300 horsepower engine with a PM10 emission rate of 0.165 lb/hr (Calpine/Bechtel 2000c, p. 5). Although weekly tests are expected to last about 30 minutes, modeling was performed assuming that the engine will operate for one hour for testing and up to 100 hours annually.

AFC Table 8.1-15 shows maximum hourly and annual fuel use for the gas turbines, duct burners, and auxiliary boilers. The maximum fuel use is combined with the emission factor for each toxic air contaminant to estimate hourly and maximum annual emissions (Calpine/Bechtel 1999a, AFC Appendix 8.1A, Table 8.1A-3). Emission factors are estimates of the amounts of toxic substances released per unit of fuel burned and are from data compiled by the Ventura County Air Pollution Control District and the California Air Toxic Emission Factors (CATEF) database maintained by the California Air Resources Board (Calpine/Bechtel 1999a, AFC p. 8.1-26).

Following publication of the Preliminary Staff Assessment, intervenors commented that the use of CATEF emission factors was not appropriate and would significantly underestimate calculated health risks. Based on a study published in 1996 for the Electric Power Research Institute (EPRI), they argued that emission rates for formaldehyde, acrolein, benzene, and acetaldehyde should be increased to account for elevated levels of combustion byproducts during startup and low-load operation. However, the EPRI study was based upon source testing a GE Frame 7 turbine utilizing steam injection for NO_x control. Because steam injection lowers the flame temperature, elevated emissions of products of incomplete combustion, such as CO and formaldehyde, are expected. As stated in the abstract for the EPRI study, the load at which a turbine operates can strongly affect emissions of formaldehyde. This effect of load is primarily due to the design and combustion characteristics of a given turbine.

In addition, U.S. EPA Region IX stated that the estimated formaldehyde emissions should be revised based upon those in "Emission factors for Hazardous Air Pollutants from Natural Gas-Fired Stationary Gas Turbines" (Table 3.1-3, EPA Pub. AP-42, 4/00). Based upon EPA's emission factors, MEC's total facility formaldehyde emissions would exceed the Clean Air Act section 112 trigger level of 10 tons annually, thus requiring additional toxics control technology.

In response to the above comments, MEC conducted full- and partial-load source tests using a Siemens-Westinghouse 501F turbine equipped with dry low Nox (DLN) combustors, as proposed for the MEC facility. In lieu of CARB method 430, EPA used Method TO-14 to test for acrolein, since method 430 is no longer an accepted test for that substance. **PUBLIC HEALTH** Table 3 summarizes the results and compares them to the CATEF and AP-42 emission factors. The results of the source tests show that the CATEF emission factors do not significantly underestimate the formaldehyde, acetaldehyde, or acrolein emissions for a utility-scale gas turbine equipped with DLN combustors, and support the original

estimates for toxic emissions used in the health risk assessment. If the highest tested formaldehyde emission factor of 0.291 lb/MM scf is used, the resulting facility formaldehyde emissions would still be less than the Clean Air Act trigger level of 10 tons per year and the total increased cancer risk for the facility would still be less than the de minimus level of 1.0.

PUBLIC HEALTH Table 3
Comparison of Emissions Factors
Siemens-Westinghouse 501F Source Tests vs. Databases (lb/MM scf)

Toxic Air Contaminant	Source Test Emission Factor ^a	CATEF Emission Factor ^b	AP-42 Emission Factor ^c
Full Load Operation			
Acetaldehyde	$<7.38 \times 10^{-2}$	6.86×10^{-2}	4.09×10^{-2}
Acrolein	$<1.16 \times 10^{-2}$	6.43×10^{-3}	6.54×10^{-3}
Formaldehyde	<0.165	0.11	0.726
Partial Load Operation			
Acetaldehyde	$<5.59 \times 10^{-2}{}^d$	n/a	4.99×10^{-2}
Acrolein	$<0.010{}^d$	n/a	n/a
Formaldehyde	0.291 ^d	n/a	3.16

a) average of three test runs is shown, except for acrolein numbers, which are based upon one test run

b) California Air Toxics Emission Factor Database

c) "Emission factors for Hazardous Air Pollutants from Natural Gas-Fired Stationary Gas Turbines", EPA Pub. no. AP-42, Table 3.1-3, 4/00; loads greater than 80 percent and variable loads less than 80 percent

d) approximately 75% load

The next step in the health risk assessment process is to estimate the ambient concentrations of toxic substances. This is accomplished by using a screening air dispersion model and assuming conditions that result in maximum impacts. The screening analysis was performed using the U.S. EPA approved ISCST3 dispersion modeling program (please see staff's **Air Quality** section for a detailed discussion of the modeling methodology). Finally, ambient concentrations were used in conjunction with RELs and cancer unit risk factors to estimate health effects which might occur from exposure to facility emissions. Exposure pathways, or ways in which people might come into contact with toxic substances, include inhalation, dermal (through the skin) absorption, soil ingestion, consumption of locally grown plant foods, and mother's milk.

The above method of assessing health effects is consistent with the California Air Pollution Control Officers Association (CAPCOA) Air Toxics "Hot Spot" Program Revised 1992 Risk Assessment Guidelines (October 1993) referred to earlier, and results in the following health risk estimates.

NONCANCER HAZARD

Construction

Due to the relatively short period of construction, only acute (short-term) health impacts are examined. The modeled one-hour maximum diesel PM₁₀ concentration

of 81.79 mg/m^3 was found to occur near the northern fenceline of the project. Areas where the one-hour concentrations are predicted to exceed the 50 mg/m^3 comparison level derived above (for diesel particulate matter only) are the uninhabited areas north and east of the proposed site. The modeled one-hour concentration at the nearest residential receptor is 46.65 mg/m^3 .

As noted earlier, the air dispersion modeling and assumptions that form the basis of screening risk analysis are designed to overestimate public health impacts, and actual risks are likely to be much lower than those calculated. Staff concludes that the modeled value of 46.65 mg/m^3 at the nearest residence does not indicate a potential for short-term health impacts strictly from diesel exhaust during construction. However, as discussed in the **Air Quality** section, the area continues to experience violations of the state 24 hour PM_{10} standard. Therefore, **Air Quality** staff recommends the installation of soot filters on stationary diesel equipment during construction. These catalyzed diesel particulate filters are passive, self-regenerating filters that reduce particulate matter, carbon monoxide, and hydrocarbon emissions through catalytic oxidation and filtration. The degree of particulate matter reduction is in the range of approximately 85-92 percent. Such filters will reduce diesel emissions during construction and further reduce any potential for health impacts.

Operation

Dispersion modeling for diesel emissions from fire pump testing resulted in a maximum modeled annual impact on the southern edge of the facility property line (Matthews 8/8/00 memo). That location has an associated chronic hazard index of .003 and a cancer risk of 4.3 in one million (see Matthews 7/28/00 memo), both less than significance levels. At the nearest residence (about 1,150 feet away, south-southeast of the proposed site), the modeled impact resulted in an acute hazard index of 0.24, a chronic hazard index of less than .001, and a cancer risk of 0.89 in one million. The Final Determination of Compliance from BAAQMD states that, since the health risk screening showed that the resulting increased carcinogenic risk is less than one in one million, the fire pump diesel engine is exempt from District permit requirements.

The screening health risk assessment for the project, including combustion and noncombustion emissions, resulted in a maximum acute hazard index of 0.33 about 0.9 miles northwest of the proposed site. The chronic hazard index at the point of maximum impact is 0.06. The location of the maximum chronic hazard is about 0.5 mile west and slightly north of the proposed site (Calpine/Bechtel 2000b, Figure 8.1D-1). As **PUBLIC HEALTH** Table 4 shows, both acute and chronic hazard indices are under the REL of 1.0, indicating that no short- or long-term adverse health effects are expected.

PUBLIC HEALTH Table 4
Operation Hazard/Risk

Type of Hazard/Risk	Hazard Index/Risk	Significance Level
ACUTE NONCANCER	0.33	1.0
CHRONIC NONCANCER	0.06	1.0
INDIVIDUAL CANCER	0.2×10^{-6}	1.0×10^{-5}

Source: Calpine/Bechtel 2000b, Table 3.6-1.

CANCER RISK

As shown in **PUBLIC HEALTH Table 4**, total worst-case individual cancer risk is estimated to be 0.20 in one million. As discussed earlier, this is the risk at the location where long-term pollutant concentrations are calculated to be the highest, and is at the same location as the maximum chronic hazard, about 0.5 mile northwest of the proposed site (Calpine/Bechtel 2000b, Figure 8.1D-1). At the nearest residence, where modeled risk from the diesel fire pump is 0.89 in one million, maximum facility risk was modeled to be 0.02 in one million (Calpine/Bechtel 2000c, p. 6). Thus, maximum risk from both sources is 0.91 in one million at that location.

CUMULATIVE IMPACTS

The maximum cancer risk for the MEC facility is 0.2 in one million, about 0.5 mile northwest of the proposed site, while the maximum risk from the diesel fire pump is 4.3 in one million, on the southern edge of the facility property line. As noted above, maximum risk from both sources is 0.91 in one million at the nearest residence. At the location of maximum impact from the MEC turbines and cooling tower (0.5 mile northwest), the fire pump will add a cancer risk of 0.01 in one million.

In comparison, BAAQMD estimated the Bay area average lifetime cancer risk for inhalation of ambient air to be 199 in one million based on 1998 ambient average toxic concentration data (BAAQMD 1999, p. 11).

These maximum impact location occurs where pollutant concentrations from MEC would theoretically be the highest. Even at this location, staff does not expect any significant change in lifetime risk to any person, and the increase does not represent any real contribution to the ambient risk of 194 in one million. Modeled facility-related risks are lower at all other locations, and actual risks are expected to be much lower, since worst-case estimates are based on conservative assumptions, and overstate the true magnitude of the risk expected. Therefore, staff does not consider the incremental impact of the additional risk posed by the MEC project to be either significant or cumulatively considerable.

The worst-case long-term health impact from MEC (0.06 hazard index) is well below the significance level of 1.0 at the location of maximum impact. At this level, staff does not expect any cumulative health impacts to be significant. As with cancer

risk, long-term hazard would be lower at all other locations, and cumulative impacts at other locations would also be less than significant.

BAAQMD staff examined the issue of cumulative impacts from facilities affecting the same neighborhood. They concluded that elevated concentrations of toxic air contaminants from stationary sources tend to be quite localized, and that cumulative risks are likely to occur only when multiple facilities with substantial low-level emissions are immediately adjacent to, or very close to, one another (BAAQMD 1993).

Even in the unlikely event that worst-case emissions from an existing facility were to coincide both geographically and temporally with MEC emissions at the location of maximum impact, the overall long-term health outlook would not change for anyone. Thus, the MEC project will not result in any significant cumulative cancer or chronic noncancer health impacts.

MITIGATION

Excavation at the site or linear facilities could disturb contaminated soil that may require mitigation measures to prevent potential public health impacts. Staff has proposed adoption of a condition of certification in the **Waste Management** section which requires the project owner to have an environmental professional on site to inspect locations where potentially contaminated soil is found, determine the need for future action, and potentially contact appropriate agencies for possible oversight.

COMPLIANCE WITH APPLICABLE LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

Staff concludes that construction and operation of the MEC project will be in compliance with all applicable LORS regarding long-term and short-term project impacts.

FACILITY CLOSURE

As noted in the introduction to this section, the scope of staff's public health analysis is limited to routine releases of harmful substances to the environment. During either temporary or permanent facility closure, the major concern would be from accidental or nonroutine releases from either hazardous materials or wastes which may be onsite. These are discussed in the sections on **Hazardous Materials** and **Waste Management**, respectively. During temporary closure (periods greater than those required for normal maintenance), it is unlikely that there would be any routine releases of harmful substances to the environment, since the facility would not be operating. For permanent closure, the only routine emissions would be related to facility demolition or dismantling, such as exhaust from heavy equipment or fugitive dust emissions. These would be subject to closure conditions adopted by the Energy Commission once a closure plan is received from the project owner.

RESPONSE TO PUBLIC AND AGENCY COMMENTS

SUZANNA WONG

SW-1 *“Total project-related health risk is needed to reflect risks from different technical areas”* – Risk estimates referred to in the Public Health section differ from those in other sections and are not directly additive. Public Health risk analysis is based on routine project operating conditions, whereas the Hazardous Material Management and Worker Safety and Fire Protection sections analyze upset conditions. Other sections, such as Waste Management and Soils and Water Resources, do not estimate risk. Air Quality compares ambient levels of pollutants to health-based standards, and does not involve a risk calculation.

SW-2 *“Provide pollutant levels and information on various parameters used for public health risk assessment”* – Informal Data Requests and Responses (April 7, 2000) for diesel exhaust from construction equipment, diesel fire pump; Supplement C to the AFC (Feb. 15, 2000) for noncriteria pollutant emission factors, emission levels, impacts; and AFC sections on air quality and public health for parameters.

SW-3 *“Explain how accumulation from deposition in soil, water, and in organs and tissues of human subjects have been accounted for in the health risk assessment”* – The exposure analysis performed as part of the screening health risk assessment includes the four minimum pathways recommended by the Office of Environmental Health Hazard Assessment: inhalation, soil ingestion, dermal exposure, and mother’s milk. Dispersion modeling provides air concentrations that are used in an environmental fate analysis to determine soils and water concentrations. Human noninhalation exposure is determined based on such concentrations. Algorithms in the health risk assessment model calculate the estimated environmental fate of facility emissions, that is, what portion of the facility’s emissions remains in the air, is deposited on the soil or in water, or is taken up by vegetation. The cancer analysis then assumes constant exposure to the substance for 70 years.

SW-4 *“The health risk assessment is not conservative because the pollutant list is not complete, some pollutant risks are not quantified, reference exposure levels (RELs) may vary, and the database for RELs and cancer potency factors are not complete”* – All identified pollutants from relevant federal and state emission factor databases and reclaimed water quality analyses were included in the health risk assessment. The assessment itself conforms with procedures approved by the Toxics Committee of the California Air Pollution Control Officers Association and the Office of Environmental Health Hazard Assessment (OEHHA), and uses cancer potency factors and RELs promulgated by OEHHA. The risk assessment procedures are specifically designed to be conservative, or health protective.

SW-5 *“Please indicate whether women during pregnancy have been included as sensitive individuals within the population for health risk considerations”* – The “Determination of Acute Reference Exposure Levels for Airborne Toxicants, March 1999” released by OEHHA states that RELs are intended to protect the individuals who live or work in the vicinity of emissions of these substances, and that

individuals in the general population who may be at greater risk for developing adverse effects following chemical exposure include those undergoing physiological change, such as pregnant women and their fetuses.

SW-6 *“For each pollutant, provide the most sensitive adverse health effect and the most sensitive individual used in the determination of the REL. Also identify the cancer type and the subjects used to determine the potency factor for cancer risk estimates”* – Note that exposure to pollutants emitted from the proposed project is not expected to result in any significant adverse public health effects. The OEHHA website (http://www.oehha.ca.gov/air/hot_spots/index.html) provides detailed information regarding the derivation of RELs and cancer potency factors. A brief discussion of the toxic air contaminants ammonia, benzene, and formaldehyde is provided here for illustrative purposes.

Acute Exposure

Ammonia: most sensitive endpoints are eyes and respiratory system; conditions which predispose people to its toxic effects include asthma and other respiratory ailments including underlying cardiopulmonary disease and lack of tolerance due to past exposures.

Benzene: most sensitive endpoints are reproductive/developmental effects; predisposing conditions are existing hematological disorders and cellular anemias, heart conditions, and obesity.

Formaldehyde: most sensitive endpoint is eye irritation; hazard index targets are eye, respiratory, and immune systems; predisposing conditions are eye, skin, respiratory, or allergic conditions, especially asthma.

Chronic Exposure

Ammonia: hazard index target is respiratory system; critical effects are pulmonary function, irritation of eye, skin, and respiratory system; uncertainty factor to account for sensitive individual – 10x.

Benzene: hazard index target is hematopoietic and nervous system; critical effects are lowered red and white blood cells; uncertainty factor to account for sensitive individual is 10x.

Formaldehyde: hazard index target is respiratory system, eyes; critical effects are eye and upper and lower airway irritation, degenerative, inflammatory and hyperplastic changes of the nasal mucosa; uncertainty factor to account for sensitive individual is 10x.

Cancer

Benzene: a combination of animal and human data were used; epidemiological data included studies of leukemia in workers exposed via inhalation.

Formaldehyde: pharmacokinetic interpolation of animal data; upper respiratory tract cancer, brain cancer, leukemia.

SW-7 *“Include a description of adverse health effects for each pollutant”* – Please see the response to SW-6.

PHIL HOLDEN

PH-2 *“What is the risk to health of nitrogen dioxide for those who are not in perfect medical condition”* - Health effects of particular concern in relation to low-level nitrogen dioxide exposure include: (1) effects of acute exposure on some

asthmatics and possibly on some persons with chronic bronchitis, (2) effects on respiratory tract defenses against infection, (3) effects on the immune system, (4) initiation or facilitation of the development of chronic lung disease, and (5) interaction with other pollutants. Groups which may be especially susceptible to nitrogen dioxide related health effects include asthmatics, persons with chronic bronchitis, infants and young children, cystic fibrosis and cancer patients, people with immune deficiencies, and the elderly. Studies using controlled brief exposures on sensitive groups have shown an increase in bronchial reactivity or airway responsiveness of some asthmatics, and decreased lung function in some patients with chronic obstructive lung disease. In general, bronchial hyperreactivity (an exaggerated tendency of the airways to constrict) is markedly greater in asthmatics than in nonasthmatics upon exposure to respiratory irritants. At exposure concentrations relevant to the current one hour ambient standard, there appears to be little, if any, effect on respiratory symptoms of asthmatics.

PH-3 *“What are the health risks of ammonia”* – There are no significant health risks from ammonia at levels expected to be emitted from the proposed project. In general, health effects from ammonia vapor can include irritation of the eyes and respiratory tract, conjunctivitis, laryngitis, and pulmonary edema.

CONCLUSIONS AND RECOMMENDATIONS

Staff has analyzed potential public health risks associated with construction and operation of the MEC project. With implementation of the condition of certification included herein, as noted, staff does not expect there to be any significant adverse cancer, or short- or long-term noncancer health effects from project emissions.

The health risk assessment performed by the applicant has been reviewed by the BAAQMD Toxics Evaluation Section and found to be in accordance with guidelines adopted by OEHHA, CARB and CAPCOA. Pursuant to the BAAQMD Risk Management Policy, the increased carcinogenic risk attributed to this project is considered to be not significant since it is less than 1.0 in one million. The chronic hazard index attributed to the emission of non-carcinogenic air contaminants is considered to be not significant since it is less than 1.0. Therefore, the MEC facility is in compliance with the BAAQMD Toxic Risk Management Policy (BAAQMD 2000b, p. 21).

CONDITION OF CERTIFICATION

PUBLIC HEALTH-1 The project owner shall perform a visual inspection of the cooling tower drift eliminators once per calendar year, and repair or replace any drift eliminator components which are broken or missing. Prior to initial operation of the project, the project owner shall have the cooling tower vendor's field representative inspect the cooling tower drift eliminator and certify that the installation was performed in a satisfactory manner. The CPM may, in years 5 and 15 of project operation, require the project owner to perform a source test of the PM₁₀ emissions rate from the cooling tower to verify continued compliance with the vendor guaranteed drift rate.

Verification: The project owner shall include the results of the annual inspection of the cooling tower drift eliminators and a description of any repairs performed in the next required annual compliance report. The initial compliance report will include a copy of the cooling tower vendor's field representative's inspection report of the drift eliminator installation. If the CPM requires a source test as specified in Public Health-1, the project owner shall submit to the CPM for approval a detailed source test procedure 60 days prior to the test. The project owner shall incorporate the CPM's comments, conduct testing, and submit test results to the CPM within 60 days following the tests.

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ATTACHMENT A - CRITERIA POLLUTANTS

OZONE (O₃)

Ozone is formed when reactive organic gases are mixed with nitrogen oxides in the presence of sunlight. Heat speeds up the reaction, typically leading to higher concentrations in the summer months. Ozone is a colorless, very reactive gas which oxidizes other materials. Oxidation damages living cells and tissues by altering their protein, lipid, and carbohydrate components or products. Such damage leads to dysfunction and death of cells in the lung and in other internal tissues.

The U.S. EPA revised the federal ozone standard on July 18, 1997 (62 Fed. Reg. 38856), based on new health studies which became available since the standard was last revised in 1979. These new studies showed that adverse health effects occur at lower ambient concentrations over longer exposure times than those reflected in the previous standard, which was based on acute health effects associated with heavy exercise and short-term exposures. The U.S. EPA's proposed ozone rule lists health effects which have been attributed to result from short-term (one to three hours) and prolonged (six to eight hours) exposure to ozone (61 Fed. Reg. 65719). However, a 1999 federal court ruling blocked implementation of the ozone 8-hour standard. EPA has asked the U.S. Supreme Court to reconsider that decision.

Acute health effects induced by short-term exposures include transient reductions in pulmonary function, and transient respiratory symptoms including cough, throat irritation, chest pain, nausea, and shortness of breath with associated effects on exercise performance. Other health effects associated with short-term or prolonged O₃ exposures include increased airway responsiveness (a predisposition to bronchoconstriction caused by external stimuli such as pollen and dust), susceptibility to respiratory infection by impairing lung defense mechanisms, increased hospital admissions and emergency room visits, and transient pulmonary inflammation.

Generally, groups considered especially sensitive to the effects of air pollution include persons with existing respiratory diseases, children, pregnant women, and the elderly. However, controlled exposure data on people in clinical settings have indicated that the population at greatest risk of acute effects from ozone exposures are children and adults engaged in physical exercise. Children are most at risk because they are active outside, playing and exercising, during the summer when ozone levels are at their highest. Adults who are outdoors and engaging in activities involving heavy levels of exertion during the summer months are also among those most at risk. Exertion increases the amount of O₃ entering the airways and can cause O₃ to penetrate to peripheral regions of the lung where lung tissue is more likely to be damaged. These individuals, as well as those with respiratory illnesses, such as asthma, can experience a reduction in lung function and increased respiratory symptoms, such as chest pain and cough, when exposed to relatively low ozone levels during periods of moderate exertion.

CARBON MONOXIDE (CO)

Carbon monoxide is a colorless, odorless gas which is a product of inefficient combustion. It does not persist in the atmosphere, but is quickly converted to carbon dioxide. However, it can reach high levels in localized areas, or "hot spots".

CO reduces the oxygen carrying capacity of the blood, thereby disrupting the delivery of oxygen to the body's organs and tissues. Persons sensitive to the effects of carbon monoxide include those whose oxygen supply or delivery is already compromised. Thus, groups potentially at risk to carbon monoxide exposure include persons with coronary artery disease, congestive heart failure, obstructive lung disease, vascular disease, anemia, the elderly, newborn infants, and fetuses (CARB 1989, p. 9). In particular, people with coronary artery disease were found to be especially at risk from carbon monoxide exposure (CARB 1989, p. 9). Tests conducted on patients with confirmed coronary artery disease indicated that exposure to low levels of carbon monoxide during exercise produced significant cardiac effects. These included earlier onset of chest pain (angina) and electrocardiographic changes indicative of effects on the heart muscle (CARB 1989, p. 6). Such changes can limit the ability of patients with coronary artery disease to exert themselves even moderately. Therefore, the statewide carbon monoxide one hour and eight hour standards were adopted in part to prevent aggravation of chest pain. Additionally, however, the standards are intended to prevent decreased exercise tolerance in persons with peripheral vascular disease and lung disease, impairment of central nervous system functions, and increased risk to fetuses (Cal. Code Regs., tit. 17, 70200).

PARTICULATE MATTER (PM)

Particulate matter is a generic term for particles of various substances which occur as either liquid droplets or small solids over a wide range of sizes. Particles having the most potential to adversely affect human health are those less than 10 micrometers (millionths of a meter) in diameter which may be inhaled and deposited into the deep portions of the lung (PM₁₀). PM may originate from anthropogenic or natural sources such as stationary or mobile combustion sources or windblown dust. Particles may be emitted directly to the atmosphere or may be the result of physical and chemical transformation of gaseous emissions such as sulfur oxides, nitrogen oxides, and volatile organic compounds. PM₁₀ includes elements such as carbon, lead, and nickel; compounds such as nitrates, organics, and sulfates; and complex mixtures such as diesel exhaust and soil. The size, chemical composition, and concentration of ambient PM₁₀ can vary considerably from area to area and from season to season within the same area.

PM₁₀ can be grouped into two general sizes of particles, fine and coarse, which differ in formation mechanisms, chemical composition, sources, and potential health effects. Fine-mode particles are those having a diameter of 2.5 micrometers or less (PM_{2.5}), while the coarse-mode fraction of PM consists of particles ranging from 10 micrometers down to 2.5 micrometers in diameter (PM_{10-2.5}). The following information on PM 2.5 health effects and federal standards is included for

information only. A 1999 federal court ruling blocked implementation of these standards. EPA has asked the U.S. Supreme Court to reconsider that decision.

PM_{2.5} is derived both from combustion by-products which have volatilized and condensed to form primary PM_{2.5} and from precursor gases reacting in the atmosphere to form secondary PM_{2.5}. Fine particles include nitrates, organic compounds, sulfates, ammonium, and trace elements (including metals) as well as elemental carbon such as soot. Major sources of fine particles are fossil fuel combustion by electric utilities, industry and motor vehicles, vegetation burning, and the smelting or other processing of metals. Dry deposition of fine mode particles is slow and such particles may have long lifetimes in the atmosphere (days to weeks) and travel hundreds to thousands of kilometers. They tend to be uniformly distributed over urban areas and larger regions and are removed from the atmosphere primarily by forming cloud droplets and falling out in raindrops.

Coarse-mode PM_{10-2.5} is formed by crushing, grinding, and abrasion of surfaces, breaking large pieces of materials into smaller pieces. Coarse particles consist mainly of soil dust containing oxides of silicon, aluminum, calcium, and iron; as well as fly ash, particles from tires, pollen, spores, and plant and insect fragments. Coarse particles normally have shorter lifetimes (minutes to hours) and only travel short distances (less than tens of kilometers). They tend to be unevenly distributed across urban areas and have more localized effects than fine particles.

Because PM₁₀ includes many different types of particles with widely divergent chemical characteristics, potential health effects depend upon the constituent make-up of PM₁₀ to which persons may be exposed.

The size of the particles inhaled determines where they are deposited in the respiratory system. Coarse particles are deposited most often in the nose and throat. Fine particles are deposited most often in the bronchial tubes and in the air sacs, with the greatest percentage being deposited in the air sacs. Particles deposited in the air sacs are removed more slowly by the body than particles in either the nose and throat or the bronchial tubes. Because of the longer residence time, they have a greater opportunity to cause adverse health effects.

Many epidemiological studies have shown that exposure to particulate matter is associated with a variety of health effects, including premature mortality, aggravation of respiratory and cardiovascular disease, changes in lung function and increased respiratory symptoms, changes to lung tissues and structure, and altered respiratory defense mechanisms. Based on their review of a number of such community epidemiological studies published after 1987 when the federal standards were last revised, the U.S. EPA concluded that then-current standards were not sufficiently stringent to prevent the occurrence of adverse public health effects. Therefore, federal PM standards were revised on July 18, 1997 (62 Fed. Reg. 38652) by adding new annual and 24-hour PM_{2.5} standards to the existing annual and 24-hour PM₁₀ standards. The U.S. EPA's review concluded that fine particles were a better surrogate for those components of PM most likely linked to mortality and morbidity effects at levels below the previous standards, while high concentrations of coarse fraction particles are linked to effects such as aggravation

of asthma. Taken together, the new standards are meant to provide increased protection against a wide range of PM-related health effects, including premature mortality and increased hospital admissions and emergency room visits, primarily in the elderly and individuals with cardiopulmonary disease; increased respiratory symptoms and disease in children and individuals with cardiopulmonary disease such as asthma; decreased lung function, particularly in children and individuals with asthma; and alterations in lung tissue and structure and in respiratory tract defense mechanisms.

California has 24-hour and annual standards for PM₁₀ only which are based on studies which describe the lowest probable effects levels and which represent the lowest pollution levels at which health effects were investigated (CARB 1982, pp. 81,84). The studies included investigations of increased rates of asthma attack, increased mortality, and changes in the health status of bronchitis patients.

California's 24-hour PM₁₀ standard is intended to prevent exacerbation of symptoms in sensitive patients with respiratory disease, declines in pulmonary function (especially in children), and excess mortality from short-term exposure (Cal. Code Regs., tit. 17, 70200). The standard is intended to provide a small margin of safety to account for the possibility of effects occurring at lower levels (CARB 1982, p. 84). The state 24 hour PM₁₀ standard was set to be more stringent than the national 24 hour PM₁₀ standard. At the time of CARB's adoption of the state standard, the U.S. EPA had not set federal 24 hour PM_{2.5} standards, and CARB found that the federal standard did not adequately protect public health (CARB 1991, p. 26).

The annual standard is based on studies which show that long-term exposure to PM₁₀ causes decreased breathing capability and increased respiratory illness in susceptible populations such as children (CARB 1991, p. 25). The annual standard is also based on the lifetime risk of cancer from exposure to carcinogenic particles known to be present in this size fraction (CARB 1982, p. 84).

NITROGEN DIOXIDE (NO₂)

Nitrogen dioxide is formed either directly or indirectly when oxygen and nitrogen in the air combine during combustion processes. It is a relatively insoluble gas which is able to penetrate deep into the lungs, its principal site of toxicity. Its toxicity is thought to be due to its capacity to initiate free radical reactions and to oxidize cellular proteins and other biomolecules (CARB 1992, Appendix A, p. 4).

Sublethal exposures in animals produce inflammation and various degrees of tissue injury characteristic of oxidant damage (Evans in CARB 1992, Appendix A, p. 5). The changes produced by low-level acute or subchronic exposure appear to be reversible when animals are allowed to recover in clean air.

Health effects of particular concern in relation to low-level nitrogen dioxide exposure include: (1) effects of acute exposure on some asthmatics and possibly on some persons with chronic bronchitis, (2) effects on respiratory tract defenses against

infection, (3) effects on the immune system, (4) initiation or facilitation of the development of chronic lung disease, and (5) interaction with other pollutants (CARB 1992, Appendix A, p. 5).

Several groups which may be especially susceptible to nitrogen dioxide related health effects have been identified (CARB 1992, Appendix A, p. 3). These include asthmatics, persons with chronic bronchitis, infants and young children, cystic fibrosis and cancer patients, people with immune deficiencies, and the elderly.

Studies using controlled brief exposures on sensitive groups have shown an increase in bronchial reactivity or airway responsiveness of some asthmatics, and decreased lung function in some patients with chronic obstructive lung disease (CARB 1992, Appendix A, p. 2). In general, bronchial hyperreactivity (an exaggerated tendency of the airways to constrict) is markedly greater in asthmatics than in nonasthmatics upon exposure to respiratory irritants (CARB 1992a, p. 107). At exposure concentrations relevant to the current one hour ambient standard, there appears to be little, if any, effect on respiratory symptoms of asthmatics (CARB 1992a, p. 108).

SULFUR DIOXIDE (SO₂)

Sulfur dioxide is formed when any sulfur-containing fuel is burned. SO₂ is highly soluble and consequently absorbed in the moist passages of the upper respiratory system. Exposure to sulfur dioxide can cause changes in lung cell structure and function that adversely affect a major lung defense mechanism known as mucociliary transport. This mechanism functions by trapping particles in mucus in the lung and sweeping them out via the cilia (fine hair-like structures) also in the lung. Slowed mucociliary transport is frequently associated with chronic bronchitis.

Exposure to sulfur dioxide can produce both short- and long-term health effects. Therefore, California has established sulfur dioxide standards to reflect both short- and long-term exposure concerns. Based on controlled exposure studies of human volunteers, investigators have found that asthmatics comprise the group most susceptible to adverse health effects from exposure to sulfur dioxide (CARB 1994, p. V-1).

The primary short-term effect is bronchoconstriction, a narrowing of the airways which results in labored breathing, wheezing, and coughing. The short-term (one hour) standard is based on bronchoconstriction and associated symptoms (such as wheezing and shortness of breath) in asthmatics and is designed to protect against adverse effects from five to ten minute exposures. In the opinion of the California Office of Environmental Health Hazard Assessment, the short-term ambient standard is likely to afford adequate protection to asthmatics engaged in short periods of vigorous activity (CARB 1994, Appendix A, p. 16).

Longer-term exposure is associated with an increased incidence of respiratory symptoms (e.g., coughing and wheezing) or respiratory disease, decreases in pulmonary function, and an increased risk of mortality (CARB 1991a, p. 12). The long-term (24 hour) standard is based upon increased incidence of respiratory

disease and excess mortality. The standard includes a margin of safety based on epidemiological studies which have shown adverse respiratory effects at levels slightly above the standard. Some of the studies indicate a sulfur dioxide threshold for effects, whereby “no adverse effects” are expected from exposures to concentrations at the state standard (Ibid.).

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WORKER SAFETY AND FIRE PROTECTION

Testimony of Kathleen Hann

INTRODUCTION

The statutory authority and requirements for worker and fire protection are set forth in laws, ordinances, regulations, and standards (LORS), and enforced through Federal, State, and local regulations. The effective implementation of worker safety programs at a facility are critical to the protection of workers from workplace hazards. These programs are documented through project specific, worker safety plans. Industrial workers at the proposed facility will operate, process equipment, and handle hazardous materials, and may face other workplace hazards that can result in accidents, serious injury or even death. The worker safety and fire protection measures proposed for this project are designed to either eliminate or minimize such hazards through special training, protective equipment or procedural controls

The purpose of this analysis is to assess the adequacy of worker safety and fire protection measures proposed by Calpine Corporation and Bechtel Enterprises, Inc. for the Metcalf Energy Center (MEC). Staff has reviewed both the original Application for Certification (AFC) submitted by (April, 1999), the October 1, 1999 AFC Supplement A, the October 15, 1999 AFC Supplement B, and the February 15, 2000 AFC Supplement C to determine whether MEC has proposed adequate measures to:

- comply with applicable safety laws, ordinances, regulations and standards;
- protect the workers during construction and operation of the facility;
- protect against fire; and
- provide adequate emergency response procedures.

Staff has determined that the features of the proposed project, in association with the proposed worker safety plans and procedures, will comply with applicable LORS and minimize the exposure of workers to industrial accidents or hazards.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

FEDERAL

In December 1970 Congress enacted Public Law 91-596, the Federal Occupational Safety and Health Act of 1970 (the Act). The Act mandates safety requirements in the workplace and is found in Title 29 of the United States Code, § 651 (29 U.S.C. §§ 651 through 678). This public law is codified at Title 29 of the Code of Federal Regulations, under General Industry Standards, Parts 1910.1 through 1910.1450 (29 CFR Part 1910.1 - 1910.1450) and clearly defines the procedures for promulgating regulations and conducting inspections to implement and enforce safety and health procedures to protect workers, particularly in the industrial sector.

Most of the safety and health standards now in force under the Act for general industry represent a compilation of materials authorized by the Act from existing federal standards and national consensus standards. These include standards from the voluntary membership organizations of the American National Standards Institute (ANSI), and the National Fire Protection Association (NFPA) which publishes the National Fire Codes.

The congressional purpose of the Act is to ““assure so far as possible every working man and woman in the nation safe and healthful working conditions and to preserve our human resources,”” (29 USC § 651). The Federal Department of Labor promulgates and enforces safety and health standards that are applicable to all businesses affecting interstate commerce. The Department of Labor established the Occupational Safety and Health Administration (OSHA) in 1971 to discharge the responsibilities assigned by the Act.

- Applicable Federal requirements include:
- 29 U.S. Code § 651 et seq. (Occupational Safety and Health Act of 1970)
- 29 CFR Part 1910.1-1910.1450 (Occupational Safety and Health
- Administration Safety and Health Regulations)
- 29 CFR Part 1952.170-1952.175

(Federal approval of California’s plan for enforcement of its own Safety and Health requirements, in lieu of most of the Federal requirements found in 29 CFR Part 1910.1-1910.1500)

STATE

California passed the Occupational Safety and Health Act of 1973 (Cal/OSHA) as published in the California Labor Code § 6300 et seq. Regulations promulgated as a result of the Act are codified at Title 8 of the California Code of Regulations, beginning with Part 450 (8 CCR Part 450 et seq.) The California Labor Code requires that the State Standards Board must adopt standards at least as effective as the federal standards, which have been, promulgated (Labor Code §142.3(a)). Health and Safety laws meet or exceed the Federal requirements. Hence, California obtained federal approval of its State health and safety regulations in lieu of the federal requirements published at 29 CFR Parts 1910.1 - 1910.1500). The Federal Secretary of Labor, however, continually oversees California’s program and will enforce any federal standard for which the State has not adopted a Cal/OSHA counterpart.

The State of California Department of Industrial Relations is charged with the responsibility for administering the Cal/OSHA plan. The Department of Industrial Relations is further split into six divisions to oversee, among other activities: industrial accidents, occupational safety and health, labor standards enforcement, statistics and research, and the State Compensation Insurance Fund (workers compensation).

Employers are responsible to insure that their employees are informed about workplace hazards, potential exposure and the work environment (Labor Code § 6408). Cal/OSHA's principal tool in ensuring that workers and the public are informed is the Material Safety Data Sheet (MSDS) (8 CCR § 5194). This regulation was promulgated in response to California's Hazardous Substances Information and Training Act of 1990 (1980 § 874 and Labor Code §§ 6360-6399.7). It mirrored the Federal Hazard Communication Standard (29 CFR Part 1910.1200) which established an employee's "right to know" about chemical hazards in the workplace, but added the provision of applicability to public sector employers.

Finally, California Senate Bill 198 requires that employers establish and maintain a written Injury and Illness Prevention Program to identify workplace hazards and communicate them to its employees through a formal employee-training program (8 CCR § 3203).

- Applicable State requirements include:
- 8 CCR § 339 - List of hazardous chemicals relating to the Hazardous Substance Information and Training Act
- 8 CCR § 450, et seq. Cal/OSHA regulations
- 24 CCR § 3, et seq. - incorporates the current addition of the Uniform Building Code
- Health and Safety Code § 25500, et seq. - Risk Management Plan requirements for threshold quantity of listed acutely hazardous materials at the facility
- Health and Safety Code § 255000 - 25541 - Hazardous Material Business Plan detailing emergency response plans for hazardous materials emergency at the facility

LOCAL

The California Building Standards Code published at Title 24 of the California Code of Regulations, (24 CCR § 3, et seq.) is comprised of eleven parts containing the building design and construction requirements relating to fire and life safety and structural safety. The Building Standards Code includes the electrical, mechanical, energy, and fire codes applicable to the project. Local planning /building & safety departments enforce the California Uniform Building Code.

National Fire Protection Association (NFPA) standards are published in the California Fire Code. The fire code contains general provisions for fire safety, including but not restricted to: 1) required road and building access; 2) water supplies; 3) installation of fire protection and life safety systems; 4) fire-resistive construction; 5) general fire safety precautions; 6) storage of combustible materials; 7) exits and emergency escapes; and 8) fire alarm systems. The California Fire Code is published at Part 9 of Title 24 of the California Code of Regulations.

Similarly the Uniform Fire Code Standards, a companion publication to the California Fire Code, contains standards of the American Society for Testing and Materials and the NFPA. It is the United State's premier model fire code. It is

updated annually as a supplement and published every third year by the International Fire Code Institute to include all approved code changes in a new edition.

Applicable local requirements include:

- 1998 Edition of California Fire Code and all applicable NFPA standards (24 CCR Part 9)
- Uniform Fire Code Standards
- California Building Code Title 24, California Code of Regulations Part 3, et seq.

SETTING

Calpine Corporation and Bechtel Enterprises, Inc. propose to jointly develop the MEC into a natural gas-fueled power plant at the southern edge of the City of San Jose in Santa Clara County. A nearby 400-acre complex is also undergoing review for development in this area. Historically, urban development has been restricted in the Coyote Valley by public policies to preserve its rural character. Within the last several decades, however, the City of San Jose has set aside the northern Coyote Valley for large single user sites where major companies can consolidate their operations.

Although the MEC site is formally within the South Santa Clara County Fire District's Jurisdiction, the City of San Jose Fire Department (SJFD) generally provides service to county pockets that are surrounded by city lands, such as the MEC site.

The SJFD Fire Station 27, as shown on WORKER SAFETY AND FIRE PROTECTION Table 1, is presently the closest station to the MEC site. It is located near Santa Teresa Park in San Jose and would provide the initial emergency response, having a response time of 7 minutes to the MEC site. Station 12, also located in San Jose with a response time of 12 minutes, would provide back-up support. Two other stations in San Jose, Stations 18 and 29, will provide additional back-up support with eight Type 1 engines, ten fire trucks, a light unit, and a water tender between them. In addition to fire response capabilities, these fire stations have first responder HAZMAT capabilities. In that respect, they are individuals who initially respond to releases or potential releases of hazardous substances for the purpose of protecting nearby persons, property or the environment from the effects of the release (reference Title 29, Code of Federal Regulations 1910.120).

In the event of a sustained hazardous materials release, the SJFD's Hazardous Incident Team (HIT Unit) will provide response support. The HIT Unit is located at SJFD Station Number 29 at 199 Innovation Drive in north San Jose. Response time is in excess of 30 minutes to the MEC site.

WORKER SAFETY AND FIRE PROTECTION Table 1 provides an outline of the equipment and personnel at each fire station.

WORKER SAFETY AND FIRE PROTECTION Table 1
Fire Station/Fire Protection Capabilities

Station	Response time	Equipment¹ (personnel per vehicle listed in parenthesis)	Number of Firefighters
Station 27 239 Bernal Road near Santa Teresa Park (408) 277-8900	Approximately 7 minutes	1 – Type 1 Engine (4) 1 – Type 4 Brush Patrol	4
Station 12 502 Calero Avenue San Jose (408) 277-4612	Approximately 12 minutes	1 – Type 1 Engine (4) 1 – Type 4 Brush Patrol	4
Station 18 Intersection of Monterey Road and Skyway Avenue (408) 277-4618	Approximately 12-15 minutes	1 – Type 1 Engine (4) 1 – Fire Truck (5) 1 – Light Unit 1 – Water Tender	9
Station 29 199 Innovation Drive (408) 277-4629	Greater than 30 minutes	1 – Type 1 Engine (4) 1 – Fire Truck (5) 1 – HIT Unit (4)	14

Source: Following is a general description of the listed response equipment:

- The Fire Engine is a primary response unit. It has a 600 gallon water tank, a minimum of 1,500 gallon per minute (gpm) pump, 2,400 feet of hose and a advance life support (ALS) medical response unit.
- Fire Trucks are also primary response units, and have a 500-gallon water tank, a 1,250-gpm pump, 1,000 feet of hose and an aerial ladder with stream capability of 1000 gpm.
- Brush Patrol is primarily used for fighting wild fires such grass fires. Each consists of a 265-gallon water tank, 150 gpm-water pump, and comes with 4-wheel drive.
- Water Tender has a 1,250-gallon water supply, a 500-gpm pump, and an auxiliary 2,000-gallon folding tank.
- Light Unit consists of a 20 kw generator and lighting capability for night operations and for use with rescue equipment on fire truck.

IMPACTS

PROJECT SPECIFIC IMPACTS

FIRE PROTECTION

Staff reviewed the information provided in the AFC regarding available fire protection services and equipment (AFC Section 8.8.1.7.2 Fire Protection), to determine if the project would adequately protect workers and if it would impact the fire protection and emergency response services of the Fire Department. The project will rely on both on-site fire protection systems and the Fire Department's fire protection and emergency response services.

The information provided in the AFC indicates that the proposed fire protection system at the site will be adequate for fighting incipient fires. The proposed fire protection system at the site includes fire alarms, detection systems, fire hydrants, and hose stations throughout the facility. Fixed fire suppression systems will be installed at pre-determined fire risk areas, such as the transformers, turbine lubrication oil equipment, and cooling tower. The facility fire mains will also supply a vapor suppression system at the aqueous ammonia storage tank area. The system will be designed and operated in accordance with National Fire Protection Association (NFPA) standards and recommendations. Sprinkler systems will be installed in the Control/Administration Building and Fire Pump Building, as required by NFPA requirements. Hand-held fire extinguishers will be located in accordance with NFPA 10 throughout the facility.

The applicant will be required to provide final diagrams and plans to staff and to the District, prior to construction and operation of the project, to confirm the adequacy of the proposed fire protection measures. All Fire Department access roads, water mains, and fire hydrants shall be installed and operational during construction in accordance with Article 87 of the Fire Code. A final inspection by the Fire Department will be required to confirm that the facility meets all the Fire and Building Code requirements, as a condition of the Building Permit.

A major fire, hazardous material release, or emergency rescue would require the services of the local Fire department. None of the nearby stations have an acceptable response time as defined by the City of San Jose Fire Department as 4-6 minutes. The nearest responder (Station 27) is at least 7 minutes away and the next responder (Station 12) is 12 minutes away. Furthermore, the nearest HIT Unit (Station 29) has a response time is well in excess of 30 minutes. Planned development of the proposed business complex on the nearby a 400-acre portion of land in the North Coyote Valley Campus industrial area will accommodate 20,000 additional jobs and require infrastructure development. It is anticipated that these improvements in infrastructure and fire protection services will be planned, funded, and constructed through creation of an assessment district by the City of San Jose. The MEC will contribute to the increased development in this area and will add to the burden on fire protection services, which are currently inadequate for either the MEC project and/or the proposed 400-acre complex.

In a letter to the California Energy Commission (August 18, 1999), the City of San Jose Fire Department indicated that the MEC project would cause significant impacts on the department's ability to provide adequate services (King, January 7, 2000). The letter explains that the AFC does not address the Fire Department's increasing workload by station companies under existing conditions. The Fire Department stated that the development of the MEC project would initiate the need for a new fire station and staffing, with a minimum of one engine and truck company. Additionally, the MEC project will require additional water main distribution lines, public water lines, public (off-site) and private (on-site) fire hydrants and other improvements required pursuant to the Uniform Fire Code.

Staff has recommended that the costs for building and staffing a new station and associated equipment be shared among all project owners who are planning development in the North Coyote Valley. The City of San Jose has expressed a desire to take the lead in resolving the issue among all developers in the area, and has proposed to establish a community Facilities District to assess fees on all development in the Coyote Valley Research Park. In this regard staff has proposed a condition of certification **WORKER SAFETY –3** to assure that the MEC's impacts to the Fire Department's fire and emergency service capabilities will be mitigated in this manner.

WORKER SAFETY

Industrial environments are potentially dangerous. Workers could be exposed to chemical spills, hazardous waste, fires, moving equipment, and confined space entry and egress problems. It is important for Calpine/Bechtel to have well-defined policies and procedures, training, and hazard recognition and control at their facility to minimize such hazards and protect workers as described below in the mitigation section of this analysis.

During construction and operation of the MEC facilities, there is the potential for both incipient (small) fires, accidental releases of flammable gasses or liquids, or emergency response incidents. Electrical sparks, combustion of fuel oil, natural gas or flammable liquids, and over-heated equipment, may cause incipient fires. Although unlikely, larger fires could develop from uncontrolled incipient fires, or from accidental releases of natural gas or other flammable gasses or liquids.

CUMULATIVE IMPACTS

The worker safety and fire hazards associated with the proposed construction and operation of the MEC, along with other proposed developments in the North Coyote area which are being permitted by San Jose County, will result in a significant cumulative impact on the fire protection and emergency service capabilities of the city and county Fire Departments but is mitigated by the assessment of fees (San Jose Community Facilities District) to provide an adequate level of service. Please refer to the discussion above and conditions of certification **Worker Safety 3**.

MITIGATION

MITIGATION OF DIRECT IMPACTS

A Safety and Health Program will be prepared by the applicant to minimize worker hazards during construction and operation. Staff uses the phrase “Safety and Health Program” to refer to the measures that will be taken to ensure compliance with the applicable LORS during the construction and operational phases of the project.

CONSTRUCTION SAFETY AND HEALTH PROGRAM

The MEC project includes construction and operation of two natural gas-fired combustion turbine generators equipped with evaporative combustion air coolers, two heat recovery steam generators equipped with duct burners, a condensing steam turbine generator, a mechanical draft cooling tower, electrical and natural gas infrastructure, and water treatment facilities. Therefore, during the construction phase of the project, workers will be exposed to hazards typical of construction and operation of a gas-fired combined cycle facility.

Construction Safety Orders are published at Title 8 of the California Code of Regulations beginning with section 1502 (8 CCR § 1502, et seq.). These requirements are promulgated by Cal/OSHA and are applicable to the construction phase of the project. The Construction Safety and Health Program will include the following:

Construction Injury and Illness Prevention Program (8 CCR § 1509)
Construction Fire Protection and Prevention Plan (8 CCR § 1920)
Personal Protective Equipment Program (8 CCR §§ 1514-1522)

Additional programs under General Industry Safety Orders (8 CCR §§ 3200-6184), Electrical Safety Orders (8 CCR §§ 2299-2974) and Unfired Pressure Vessel Safety Orders (8 CCR §§ 450-544) include:

- Electrical Safety Program
- Unfired Pressure Vessel Safety Orders
- Equipment Safety Program
- Forklift Operation Program
- Excavation/Trenching Program
- Fall Prevention Program
- Scaffolding/Ladder Safety Program
- Articulating Boom Platforms Program
- Crane and Material Handling Program
- Housekeeping and Material Handling and Storage Program
- Hot Work Safety Program
- Respiratory Protection Program
- Employee Exposure Monitoring Program
- Confined Space Entry Program

- Hand and Portable Power Tool Safety Program
- Hearing Conservation Program
- Back Injury Prevention Program
- Hazard Communication Program
- Air Monitoring Program
- Heat and Cold Stress Monitoring and Control Program
- Pressure Vessel and Pipeline Safety Program

The AFC includes adequate outlines of each of the above programs. Prior to construction of the MEC, detailed programs and plans will be provided pursuant to the condition of certification **WORKER SAFETY-1**.

OPERATION SAFETY AND HEALTH PROGRAM

Upon completion of construction and prior to operations at MEC, the Operations Safety and Health Program will be prepared pursuant to regulatory requirements of Title 8 of the California Code of Regulations. MEC's Operation Safety and Health Program will include the following programs and plans:

- Injury and Illness Prevention Program (8 CCR § 3203)
- Emergency Action Program/Plan (8 CCR § 3220);
- Fire Protection and Prevention Program (8 CCR § 3221); and;
- Personal Protective Equipment Program (8 CCR §§ 3401-3411);

Additional programs under General Industry Safety Orders (8 CCR §§ 3200-6184), Electrical Safety Orders (8 CCR §§2299-2974) and Unfired Pressure Vessel Safety Orders (8 CCR §§ 450-544) include:

- Motor Vehicle and Heavy Equipment Safety Program;
- Forklift Operation Program
- Excavation/Trenching Program
- Fall Protection Program
- Scaffolding/Ladder Safety Program
- Crane and Material Handling Program
- Hazard Communication Program
- Hot Work Safety Program
- Respiratory Protection Program
- Electrical Safety Program
- Confined Space Entry Program
- Hand and Portable Power Tool Safety Program
- Housekeeping and Material Handling and Storage Program
- Hearing Conservation Program
- Back Injury Prevention Program
- Safe Driving Program
- Employee Exposure Monitoring Program
- Heat and Cold Stress Monitoring and Control Program
- Pressure Vessel and Pipeline Safety Program

The AFC includes adequate outlines of each of the above programs. Prior to operation of the proposed MEC, detailed programs and plans will be provided pursuant to the condition of certification WORKER SAFETY-2.

SAFETY AND HEALTH PROGRAM ELEMENTS

MEC provided the proposed outlines for both a Construction Safety and Health Program and an Operation Safety and Health Program. The measures in these plans are derived from applicable sections of state and federal law. The major items required in both Safety and Health Programs are as follows:
Injury and Illness Prevention Program (IIPP)

MEC will submit an expanded Construction and Operations Illness and Injury Prevention Programs to Cal/OSHA for review and comment 30 days prior to both construction and operation of the project. The IIPP will include the following components as presented in MEC outline:

- Responsible personnel
- Safety and health policy
- Work rules and safe work practices
- System for ensuring that employee compliance with safe work practices
- Employee communications
- Identification and evaluation of workplace hazards
- Methods and/or procedures for correcting unsafe or unhealthy conditions, practices, or procedures in a timely manner based upon severity of the hazards
- Specific safety procedures (included in Operations Safety and Health Program)
- Training and instruction

Cal/OSHA will review and provide comments on the IIPP as the result of an onsite consultation at MEC's request. A Cal/OSHA representative will complete a physical survey of the site, analyze work practices, and assess those practices that may likely result in illness or injury. This on-site consultation will give Cal/OSHA an opportunity to evaluate MEC's IIPP in conjunction with the activities occurring on site.

EMERGENCY ACTION PLAN

- California regulations require an Emergency Action Plan (8 CCR § 3220). The AFC contains a satisfactory outline for an emergency action plan. The outline lists the following features:
- Emergency escape procedures and emergency escape route assignments
- Procedures to be followed by employees who remain to operate critical plant operations before they evacuate
- Procedures to account for all employees after emergency evacuation has been completed
- Rescue and medical duties for employees
- Fire and emergency reporting procedures
- Alarm and communication system
- Contact personnel

- Response procedures for ammonia release
- Training requirements

Staff proposed a condition of certification WORKER SAFETY-2, which requires MEC to submit a final Operation's Emergency Action Plan to Cal/OSHA for review and comment after an on-site consultation. It also requires that MEC submit the final Operation's Emergency Action Plan to the Fire Department for review and approval.

FIRE PREVENTION PLAN

California Code of Regulations requires Construction and Operation Fire Prevention Plans (8 CCR § 1920 and 3221). The AFC contains a draft proposed fire prevention plan which is acceptable to staff. The Construction and Operations Fire Prevention Plans, which are required to be developed by staff's recommended conditions of certification WORKER SAFETY-1 AND 2, will need to include the following topics:

- General requirements
- Fire hazard inventory, including ignition sources and mitigation
- Housekeeping and proper materials storage
- Employee alarm/communication system
- Portable fire extinguishers
- Fixed firefighting equipment
- Fire control
- Flammable and combustible liquid storage
- Use of flammable and combustible liquids
- Dispensing and disposal of liquids
- Training
- Contact personnel
- Local fire protection services

The conditions of certification also require MEC to submit a copy of the Construction and Operations Fire Prevention Plans to the California Energy Commission compliance Project Manager (CPM) and Fire District for review and approval.

PERSONAL PROTECTIVE EQUIPMENT PROGRAM

California regulations stipulate that Personal Protective Equipment (PPE) and first aid supplies are required whenever hazards are encountered which, due to process, environment, chemicals or mechanical irritants can cause injury or impair bodily function, as a result of absorption, inhalation or physical contact (8 CCR § 3380-3400). MEC's operational environment will require PPE.

The PPE Program ensures that employers comply with the applicable requirements for PPE and provide employees with the information and training necessary to implement the program. MEC provided a satisfactory outline that identifies minimum requirements of a proposed PPE program. The components of MEC's program as outlined include:

- Hazard analysis and prescription of PPE
- Personal protective devices
- Head protection
- Eye and face protection
- Body protection
- Hand protection
- Foot protection
- Skin protection
- Sanitation
- Safety belts and lifelines for fall protection
- Protection for electric shock
- Medical services and first aid/ bloodborne pathogens
- Respiratory protective equipment
- Hearing protection
- Training

Staff evaluated MEC's outline and assessed that the proposed PPE Program contains the elements that will meet applicable regulations and will significantly reduce the potential impact upon workers.

GENERAL SAFETY

In addition to the specific plans listed above, there are additional LORS applicable to the project, which are called "safe work practices". Both the Construction and the Operations Safety Programs will address safe work practices under a variety of programs. The components of these programs are presented in the following paragraphs.

MOTOR VEHICLE AND HEAVY EQUIPMENT SAFETY PROGRAM

This program concerns the operation and maintenance of vehicles, inspections, personal protective equipment and traffic safety training for employees working on, near, or with heavy equipment or vehicles. A safe driving training program will be included in the operations safety program.

FORKLIFT OPERATION PROGRAM

Forklift operation will utilize only trained and certified operators. The training program will include safe fueling procedures and forklift driving.

EXCAVATION/TRENCHING PROGRAM

A Cal/OSHA permit is required for certain trenches, excavations, structures, scaffolding and dismantling. MEC's program will include:

- Shoring, sloping, and benching requirements
- Cal/OSHA permit requirements
- Inspection
- Air monitoring

- Access and egress

FALL PROTECTION PROGRAM

Worker training will identify fall hazards and evaluate the appropriate protection devices, such as safety harnesses.

SCAFFOLDING / LADDER SAFETY PROGRAM

Workers will be trained in the construction, inspection and proper use of ladder and scaffolding equipment, and the appropriate safety and protective equipment to use.

ARTICULATING BOOM PLATFORMS PROGRAM

This program consists of:

- Inspection of equipment
- Load ratings
- Safe operating parameters
- Operator training

CRANE AND MATERIAL HANDLING PROGRAM

Only certified and licensed operators will be permitted to operate crane. Worker training will include:

- Inspection of equipment
- Load ratings
- Safe operating parameters

HOT WORK SAFETY PROGRAM

Hot work is that which causes a spark and can ignite a fuel source, such as welding, cutting and brazing. Before proceeding with hot work, workers will request a work authorization for the projects assigned Safety Officer. The control operator, shift supervisor will determine if hot work is required. Before proceeding, the area will be inspected and the job posted. MEC's proposed Hot Work Safety Program would include:

- Welding and cutting procedures
- Fire watch
- Hot work permit
- Personnel protective equipment
- Training

EMPLOYEE EXPOSURE MONITORING PROGRAM

Routine medical surveillance will be conducted on workers to evaluate and monitor individual exposure to hazardous conditions or substances. This program includes:

- Exposure evaluation
- Monitoring and reporting requirements

- Medical surveillance
- Training

ELECTRICAL SAFETY PROGRAM

MEC's Electrical Safety Program will include procedures for grounding, lock-out/tag-out, overhead and underground utilities, utility clearance and employee training. Lock-out/tag-out requirements are specified under Title 8 of the California Code of Regulations (8 CCR Sections 2320.4, 2320.5, 2320.6, 2530.43, 2530.86, 3314, 3340 and 3341). These procedures reduce employee exposure to moving equipment, electrical shock, and hazardous and toxic materials. Lock-out is the placement of a padlock, blank flange, or similar device on equipment to ensure it will not be operated until the lock-out device is removed. Tag-out procedures utilize warning signs that caution personnel when equipment can not be energized until the lock-out device is removed. Warning signs are used to alert employees to the presence of hazardous and toxic materials. MEC's lock-out/tag-out program will include steps for applying and removing locks and tags, and employee training procedures.

CONFINED SPACE ENTRY

The California Code of Regulations identifies the minimal standards for preventing employee exposure to dangerous air contaminants and/or oxygen deficiency in confined spaces, where there is an oxygen-deficient atmosphere, a limited means of egress, or a source of toxic or flammable contaminants (8 CCR Sections 5156-5168). Confined spaces include silos, tanks, vats, vessels, boilers, compartments, ducts, sewers, pipelines, vaults, bins and pits. MEC included an outline of their permit-required confined space entry program, which includes the following components:

- Air monitoring and ventilation requirements
- Rescue procedures
- Lock-out / tag-out and blocking, blinding, and blanking requirements
- Permit completion
- Training

Before entering a confined space, site personnel will evacuate or purge the space and disconnect the lines that provide access of substances into the space. The air in the vessel will be tested for oxygen deficiency, and the presence of toxic and explosive gases and vapors. Employees will wear lifelines or safety harnesses when entering the confined space, and a person will be stationed outside the confined space to handle the line and summon assistance in case of emergency. Appropriate respirators will be available under hazardous conditions.

HAND AND PORTABLE POWER TOOL SAFETY PROGRAM

This program applies to construction and operations. It will include guarding and proper operations of power tools and worker training.

HOUSEKEEPING AND MATERIAL HANDLING AND STORAGE PROGRAM

This program concerns storage requirements and proper handling of equipment, and keeping walkways and work surfaces clean and safe. Worker training includes good housekeeping practices.

HEARING CONSERVATION PROGRAM

This program identifies high-noise environments and assigns hearing protective devices appropriate to the noise level. Although hearing protection is included in personal protective equipment, this program includes exposure monitoring and medical surveillance, along with worker training.

BACK INJURY PREVENTION PROGRAM

Worker training in this program will consider proper lifting practices and material handling procedures.

HAZARD COMMUNICATION PROGRAM

The Hazard Communications Standard establishes an employee's right to know about chemical hazards in the workplace. In accordance with federal and State requirements, MEC will prepare a list of hazardous substances and provide a Material Safety Data Sheet (MSDS) for each substance on the list found in the workplace. MEC will train workers to understand MSDS and to work safely with hazardous substances. Worker training in this program will also include proper labeling, storage and handling of hazardous materials.

RESPIRATORY PROTECTION PROGRAM

Respiratory protection is also incorporated in the personal protective equipment. This program includes:

- Proper selection and use of a respirator
- Fit testing
- Medical requirements
- Inspection, repair, cleaning and storage of respirator
- Training

HEAT AND COLD STRESS MONITORING AND CONTROL PROGRAM

This program includes monitoring, prevention and control for workers in hot or cold environments.

PRESSURE VESSEL AND PIPELINE SAFETY PROGRAM

Workers at pressure vessels and pipelines will be trained in the following procedures:

- Line-breaking policy
- Equipment inspection and maintenance
- Blocking, bleeding, and blanking
- Communication

MITIGATION OF CUMULATIVE IMPACTS

The worker safety protection programs proposed by MEC will be applicable to the construction and operation of the MEC facility and will provide adequate protection for workers at that facility. Staff's recommended condition of certification Worker Safety-3 will ensure that the MEC's contribution to cumulative impacts to the Fire Department's fire protection and emergency service capabilities will be adequately mitigated.

FACILITY CLOSURE

The project owner/operator is responsible for maintaining an operational fire protection system during closure activities. The project must also stay in compliance with all applicable health and safety LORS during that time.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

If MEC provides: (1) a Construction Safety and Health Plan, and an Operation Safety and Health Plan, as required by conditions of certification WORKER SAFETY 1 and 2; and (2) provides funding for additional fire protection services capabilities as required in condition of certification Worker Safety-3, staff believes that the project will incorporate sufficient measures to ensure adequate levels of worker safety and fire protection, and comply with applicable LORS.

RECOMMENDATIONS

If the Commission certifies the project, staff recommends that the Commission adopt the following proposed conditions of certification. The proposed conditions of certification provide assurance that the Project Construction and Operation Safety and Health Programs proposed by the project owners will be reviewed by the appropriate agencies before implementation. The conditions also require verification that the proposed plans adequately assure worker safety and fire protection and comply with applicable LORS.

PROPOSED CONDITIONS OF CERTIFICATION

WORKER SAFETY-1 The project owner shall submit to the CPM a copy of the Project Construction Safety and Health Program, containing the following:

- a construction Injury and Illness Prevention Program
- a construction Fire Protection and Prevention Plan
- a personal Protective Equipment Program

Protocol: The Construction Injury and Illness Prevention Program and the Personal Protective Equipment Program shall be submitted to the California Department of Industrial Relations, Division of Occupational Safety and

Health (Cal/OSHA) Consultation Service, for review and comment concerning compliance of the program with all applicable Safety Orders.

The Construction Fire Protection and Prevention Plan shall be submitted to the City of San Jose Fire Department for review and acceptance.

Verification: At least 30 days prior to the start of construction, or a date agreed to by the CPM, the project owner shall submit to the CPM a copy of the Project Construction Safety and Health Program and the Personal Protective Equipment Program, with a copy of the cover letter transmittal of the programs to Cal/OSHA Consultation Service. The project owner shall provide a letter from the San Jose Fire Department stating that they have reviewed and accepted the Construction Fire Protection and Prevention Plan.

WORKER SAFETY-2 The project owner shall submit to the CPM a copy of the Project Operation Safety and Health Program containing the following:

- an Operation Injury and Illness Prevention Plan
- an Emergency Action Plan
- on Operation Fire Protection Plan
- a Personal Protective Equipment Program

Protocol: The Operation Injury and Illness Prevention Plan, Emergency Action Plan, and Personal Protective Equipment Program shall be submitted to the California Department of Industrial Relations, Division of Occupational Safety and Health (Cal/OSHA) Consultation Service for review and comment concerning compliance of the program with all applicable Safety Orders. The operation's Emergency Action Plan and Fire Protection Plan shall be submitted to the San Jose Fire Department for review and acceptance. The final versions of the operation Injury and Illness Prevention Plan, Emergency Action Plan, Fire Protection Plan and Personal Protective Equipment Program shall incorporate Cal/OSHA and San Jose Fire Department comments that were received and accepted.

Verification: Verification: 2 At least 30 days prior to the start of operation, the project owner shall submit to the CPM a copy of the final version of the Project Operation Safety & Health Program with a copy of the cover letter to Cal/OSHA's Consultation Service, and San Jose Fire Department comments stating that they have reviewed and accepted the specified elements of the proposed Operation Safety and Health Plan.

The project owner shall notify the CPM that the Project Operation Safety and Health Program (Injury and Illness Prevention Plan, Fire Protection Plan, the Emergency Action Plan, and Personal Protective Equipment requirements), including all records and files on accidents and incidents, is present on-site and available for inspection.

WORKER SAFETY-3 The project owners shall reach an agreement with the City of San Jose Fire Department, through the City of San Jose Community Facilities District, on the amount of fees and timing of payment they will provide to cover project-specific impacts associated with worker safety and fire protection

If an agreement cannot be reached at least 60 days prior to construction, the project owner will inform the CPM and propose a plan to mitigate impacts on fire services. The plan shall include interim funding of an additional fire station, staffing, equipment, one engine, truck; requirements for water main distribution lines, public water lines, public (off-site) and private (onsite) fire hydrants. Within 60 days the CPM in consultation with the parties will propose an interim fee schedule for payment by the project owners.

Verification: Not later than 60 days prior to any ground disturbance, the project owners shall provide the CPM with a copy of an agreement with the City of San Jose Fire Department or shall provide an interim plan to address impacts until a permanent agreement can be reached.

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TRANSMISSION LINE SAFETY AND NUISANCE

Obed Odoemelum, Ph.D.

INTRODUCTION

The energy generated at the proposed Metcalf Energy Center (MEC) will be transmitted into the existing PG&E power grid through a new 240-foot 230 kV overhead transmission line. The route was chosen to minimize the length of new line necessary to transmit the generated energy into the power grid. The purpose of staff's analysis is to assess this proposed line design for measures necessary to prevent possible health and safety hazards. Such hazard prevention is accomplished through compliance with laws, ordinances, regulations and standards (LORS) applicable to the proposed project (Calpine/Bechtel 1999a, AFC pages 5-15 through 5-18). The assessment will evaluate the following issues, that relate primarily to the physical presence of the line, or secondarily to the physical interactions of the line's electric and magnetic fields:

- aviation safety;
- interference with radio-frequency communication;
- audible noise;
- fire hazards;
- hazardous shocks;
- nuisance shocks; and
- electric and magnetic field (EMF) exposure.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

Discussed below by subject area are design-related LORS applicable to the physical impacts of the transmission lines proposed for MEC. The impacts of concern are addressed through specific federal or state regulations or through established industry standards and practices. There presently are no local laws or regulations specifically aimed at the physical structure or dimensions of electric power lines to limit the impacts noted above.

AVIATION SAFETY

Any hazard to area aircraft relates to the potential for collision with the line in the navigable air space. The applicable federal LORS as discussed below are intended to ensure the distance and visibility necessary to avoid such collision throughout the country.

FEDERAL

- Title 14, Part 77 of the Federal Code of Regulations (CFR), "Objects Affecting the Navigation Space". Provisions of these regulations specify the criteria used by the Federal Aviation Administration (FAA) for determining whether a "Notice

of Proposed Construction or Alteration” is required for potential obstruction hazards. The need for such a notice depends on factors related to the height of the structure, the slope of an imaginary surface from the end of nearby runways to the top of the structure, and the length of the runway involved. Such notification allows the FAA to ensure that the structure is located to avoid any significant hazards to area aviation.

- FAA Advisory Circular (AC) No. 70/460-2H, “Proposed Construction and or Alteration of Objects that may Affect the Navigation Space”. This circular informs each proponent of a project that could pose an aviation hazard of the need to file the “Notice of Proposed Construction or Alteration” (Form 7640) with the FAA.
- FAA AC No. 70/460-1G, “Obstruction Marking and Lighting”. This circular describes the FAA standards for marking and lighting objects that may pose a navigation hazard as established using the criteria in Title 14, Part 77 of the CFR.

INTERFERENCE WITH RADIO-FREQUENCY COMMUNICATION

Transmission line-related radio-frequency interference is one of the indirect effects of line operation as produced by the physical interactions of line electric fields. The level of such interference usually depends on the magnitude of the electric fields involved. Because of this, the potential for such impacts could be assessed from field strength estimates obtained for the line. The following regulations are intended to ensure that such lines are located away from areas of potential interference and that any interference is mitigated whenever it occurs.

FEDERAL

- Federal Communications Commission (FCC) regulations in Title 47 CFR, Section 15.25. Provisions of these regulations prohibit operation of any devices producing force fields, which interfere with radio communications, even if (as with transmission lines) such devices are not intentionally designed to produce radio-frequency energy. Such interference is due to the radio noise produced by the action of the electric fields on the surface of the energized conductor. The process involved is known as corona discharge but is referred to as spark gap electric discharge when it occurs within gaps between the conductor and insulators or metal fittings. When generated, such noise manifests as perceivable interference with radio or television signal reception or interference with other forms of radio communication. Since the level of interference depends on factors such as line voltage, distance from the line to the receiving device, orientation of the antenna, signal level, line configuration and weather conditions, maximum interference levels are not specified as design criteria for modern transmission lines. The FCC requires each line operator to mitigate all complaints about interference on a case-specific basis. Staff usually recommends specific conditions of certification to ensure compliance with this FCC requirement. Since electric fields cannot penetrate the soil and other

objects, underground lines do not produce the radio noise associated with overhead lines.

STATE

- General Order 52 (GO-52), California Public Utilities Commission (CPUC). Provisions of this order govern the construction and operation of power and communications lines and specifically deal with measures to prevent or mitigate inductive interference. Such interference is produced by the electric field induced by the line in the antenna of a radio signal receiver.

Several design and maintenance options are available for minimizing these electric field-related impacts. When incorporated in the line design and operation, such measures also serve to reduce the line-related audible noise discussed below.

AUDIBLE NOISE

FEDERAL

As with radio noise, any audible noise from a transmission line usually results from the action of the electric field at the surface of the line conductor and could be perceived as a characteristic crackling, frying or hissing sound or hum. Since (as with communications interference), the noise level depends on the strength of the line electric field, the potential for occurrence can be assessed from estimates of the field strengths expected during operation. Such noise is usually generated during wet weather and from lines of 345 kV or higher. It therefore, is generally not expected at significant levels from lines of less than 345 kV such as the one proposed for MEC. Research by the Electric Power Research Institute (EPRI 1982) has validated this by showing the fair-weather audible noise from modern transmission lines to be generally indistinguishable from background noise at the edge of a 100-ft right-of-way. There are no design-specific regulations to limit the audible noise from transmission lines. As with radio noise, such noise is limited instead through design and maintenance standards established from industry research and experience as effective without significant impacts on line safety, efficiency maintainability and reliability. All high-voltage lines are designed to assure compliance.

NUISANCE SHOCKS

FEDERAL

Nuisance shocks around transmission lines are non-hazardous but unpleasant experiences caused by current flow at levels generally incapable of causing significant physiological harm. Such shocks mostly result from direct contact with metal objects electrically charged by fields from the energized line. Such electric charges are induced in different ways by the line electric and magnetic fields. For modern high-voltage lines, shocks of this type are effectively minimized through grounding procedures specified in the National Electrical Safety Code and the joint guidelines of the American National Standards Institute (ANSI) and the Institute of

Electrical and Electronics Engineers (IEEE). As with lines of the type proposed, the applicant will be responsible in all cases for ensuring compliance with these grounding-related practices within the right-of-way. Staff usually recommends specific conditions of certification to ensure that such grounding is made within the right-of-way by both the applicant and property owners.

FIRE HAZARDS

The fire hazards addressed through the following regulations are those that could be caused by sparks from conductors of overhead lines or that could result from direct contact between the line and nearby trees and other combustible objects.

STATE

- General Order 95 (GO-95), CPUC, “Rules for Overhead Electric Line Construction”. This order specifies tree-trimming criteria to minimize the potential for power line-related fires.
- Title 14 Section 1250 of the California Code of Regulations, “Fire Prevention Standards for Electric Utilities”. This code specifies utility-related measures for fire prevention.

HAZARDOUS SHOCKS

The hazardous shocks that are addressed by the following regulations and standards are those that could result from direct or indirect contact between an individual and the energized line. Such shocks are capable of serious physiological harm or death and remain a driving force in the design and operation of transmission and other high-voltage lines.

FEDERAL

- National Electrical Safety Code, Part 2: Safety Rules for Overhead Lines. Provisions in this part of the code specify the national safe operating clearances applicable in areas where the line might be accessible to the public. Such requirements are intended to minimize the potential for direct or indirect contact with the energized line.

STATE

- GO-95, CPUC. “Rules for Overhead Line Construction”. These rules specify uniform statewide requirements for overhead line construction regarding ground clearance, grounding, maintenance and inspection. Implementing these requirements usually ensures the safety of the general public and line workers.
- Title 8, CCR, Section 2700 et seq., “High Voltage Electric Safety Orders”. These safety orders establish essential requirements and minimum standards for safely installing, operating, and maintaining electrical installations and equipment.

ELECTRIC AND MAGNETIC FIELD EXPOSURE

The possibility of health effects of electric fields and magnetic fields has increased public concern in recent years about living near high-voltage lines. Both fields occur together whenever electricity flows, hence the general practice of considering both as EMF exposure. As noted by Calpine/Bechtel (1999a, AFC page 5-9), the available evidence, as evaluated by CPUC and other regulatory agencies, has not established that such fields pose a significant health hazard to exposed humans. However, staff considers it important, as does the CPUC, to note that while such a hazard has not been established from the available evidence, the same evidence does not serve as proof of a definite lack of a hazard. Staff, therefore considers it appropriate, in light of present uncertainty, to reduce such fields to some degree, where feasible, until the issue is better understood. The challenge has been to establish when, and how far to reduce them. Several regulations have been established to control human exposure.

While there is considerable uncertainty about the EMF/health effects issue, the following facts have been established from the available information and have been used to establish existing policies:

- Any exposure-related health risk to the exposed individual will likely be small.
- The most biologically significant types of exposures have not been established.
- Most health concerns relate to the magnetic field.
- The measures employed for such field reduction can affect line safety, reliability, efficiency and maintainability, depending on the type and extent of such measures.

FEDERAL

No federal regulations have been established specifying environmental limits on the strengths of fields from power lines. However, the federal government continues to conduct and encourage research necessary for an appropriate policy on the EMF issue.

In the face of the present uncertainty, several states have opted for design-driven regulations ensuring that fields from new lines are generally similar to those from existing lines. Some states (Minnesota, Florida, New York, Montana, and New Jersey) have set specific environmental limits on one or both fields in this regard. These limits are, however, not based on any specific health effects. All regulatory agencies believe, as does staff, that health-based limits are inappropriate at this time. They also believe that the present knowledge of the issue does not justify any retrofit of existing lines.

Before the present health-based concern developed, measures to reduce field effects from power line operations were mostly aimed at the electric field component, whose effects can manifest as the previously noted radio noise, audible noise and nuisance shocks. The present focus is on the magnetic field because only it can penetrate building materials to potentially produce the types of health

impacts at the root of the present concern. As one focuses on the strong magnetic fields from the more visible transmission and other high-voltage power lines, staff considers it important for perspective, to note that an individual in a home could be exposed for short periods to much stronger fields while using some common household appliances (National Institute of Environmental Health Services and the U.S Department of Energy 1995). Scientists have not established which of these types of exposures would be more biologically meaningful in the individual. Staff notes such exposure differences only to show that high-level magnetic field exposures regularly occur in areas other than the power line environment.

STATE

In California, the CPUC (which regulates the installation and operation of high-voltage lines in California) has determined that only no-cost or low-cost measures are presently justified in any effort to reduce power line fields beyond levels existing before the present health concern arose. The CPUC has further determined that such reduction should be made only in connection with new or modified lines. It required each utility within its jurisdiction to establish EMF-reducing design guidelines for all new or upgraded power lines and related facilities within their respective service areas. The CPUC further established specific limits on the resources to be used in each case for field reduction. Such limitations were intended by the CPUC to apply to the cost of any redesign to reduce field strength or relocation to reduce exposure. Utilities not within the jurisdiction of the CPUC voluntarily comply with these CPUC requirements. This CPUC policy resulted from assessments made to implement CPUC Decision 93-11-013 of 1989.

In keeping with this CPUC policy, staff requires a showing that each proposed line will be designed according to the EMF-reducing design guidelines applicable to the utility service area involved. These field-reducing measures can impact line operation if applied without appropriate regard for environmental and other local issues bearing on safety, reliability, efficiency and maintainability. It is therefore, up to each applicant to ensure that such measures are applied in ways, and to an extent, without significant impacts on line operation. The extent of such applications will be reflected by the ground-level field strengths as measured during operation. When estimated or measured for the line, such field strengths can be used by staff and other regulatory agencies for comparison with fields of lines of similar voltage and current-carrying capacity. Such field strengths can be estimated for any given design using established procedures. Estimates are specified for a height of one meter above the ground, in units of kilovolts per meter (kV/m), for the electric field, and milligauss (mG) for the companion magnetic field. Their magnitude depends, in the case of electric fields, on line voltage, the geometry of the structures, degree of cancellation from nearby conductors, distance between conductors and, in the case of magnetic fields, amount of current in the line.

Since each new line in California is currently required to be designed according to the EMF-reducing guidelines of the utility in the service area involved, their fields are required under existing CPUC policies to be similar to fields from similar lines in that service area. A condition of certification is usually proposed by staff to ensure implementation of the reduction measures necessary.

SETTING

According to information from Calpine/Bechtel (1999a, AFC pages 5-1 through 5-5), the proposed power plant is adjacent to a wide PG&E transmission line right-of-way that accommodates five transmission lines of 115 kV, 230 kV and 500 kV. These lines connect to the nearby PG&E Metcalf Substation. It is the closest of these circuits, the 230 kV Monte-Vista No. 4 transmission line, to which the proposed power line will be connected. When power flows into the PG&E grid from the proposed MEC, it will increase or reduce the amount flowing within the other lines (along with the related magnetic fields), depending on the operative dispersion pattern. At 240 feet, the proposed line will be short compared to the lines within the existing corridor which extend over 31 miles from the point of connection to the next substation, the Monta-Vista Substation. The line's field impacts could be considered in terms of field strengths within the 240-foot route and contribution along the existing 31-mile corridor. Contribution within this corridor will be reflected by field strength changes at the maximum impact point for fields from the proposed MEC line and the other lines in the corridor.

As discussed by Calpine/Bechtel (1999a, AFC pages 5-12 and 8.4-6), the proposed route will traverse an area of primarily vacant land and agricultural land along its 240-foot route. The interconnection point will be approximately 250 feet from Monterey Road, the nearest area of potential public exposure; this PG&E corridor crosses Monterey Road immediately northwest of the interconnection point. The nearest residence to the interconnection point along the Monterey Road will be more than 1,500 ft away. This means that long-term residential magnetic field exposure would be minimal. Any exposure of potential concern would be limited to line workers and individuals in transit across the right-of-way.

PROJECT DESCRIPTION

The proposed transmission line will consist of the components listed below:

- a double circuit 230 kV overhead line approximately 240 feet long extending from MEC to the existing Metcalf/Monte Vista No. 4 PG&E transmission line; and
- a new 230 kV switchyard at the MEC.

The line will extend from two 70 ft tall H-shaped take-off support structures within the new MEC switchyard to the Metcalf/Monte Vista No. 4, 230 kV transmission line, where it will be connected to the line's 174-ft tower (Calpine/Bechtel 1999a, AFC page 8.11-15). These take-off structures will be spaced approximately 50 feet apart. The route of the line will exit MEC to the north, and immediately cross a small stream, Fisher Creek, to the north as it joins the existing PG&E transmission corridor to the north (Calpine/Bechtel 1999a, AFC page 5-4). Since the proposed line will be connected to an existing PG&E line, it will be constructed with the same type of conductor used in the PG&E line. The field-reduction measures to be applied are specified in PG&E's field reduction guidelines for lines of this type (Calpine/Bechtel 1999a, AFC pages 5-8 and 5-12 and 5-13). Calpine/Bechtel have provided the details of their EMF reduction approach as specified in these guidelines.

IMPACTS

GENERAL IMPACTS

As noted in the LORS section, GO-95 and Title 8, CCR Section 2700 et seq. provide the minimum regulatory requirements necessary to avoid the direct or indirect contact previously discussed in connection with hazardous shocks and aviation hazards. Of secondary concern are the field-related impacts manifesting as nuisance shocks, radio noise, communications interference and magnetic field exposure. The relative magnitude of such impacts would be reflected in the field strengths characteristic of a given line design. Since the field-reducing measures can affect line operations, the extent of their implementation, together with related field strengths, will vary according to environmental and other local conditions bearing on line safety, efficiency, reliability and maintainability. They will, therefore, vary from one service area to the other according to prevailing conditions. Each project proponent will apply such measures to the extent appropriate for the geographic area involved. The potential for all these impacts is assessed separately for each proposed project.

PROJECT SPECIFIC IMPACTS

AVIATION SAFETY

The MEC site is proposed for a location with no major airports in its immediate vicinity. As noted by the Calpine/Bechtel (1999a, AFC page 5-15), the closest airfield is Canyon Creek Heliport at Morgan Hill, 7.2 nautical miles southwest of the MEC. The next closest airport is Reid-Hillview Airport in San Jose, 7.6 miles northwest of MEC. An FAA "Notice of Construction or Alteration" will not be required for the proposed power line, according to existing regulatory criteria. However, owners of transmission lines generally inform the FAA about such lines before construction, even when the FAA notice is not required. From its consideration of all issues related to distance from the line and FAA safety requirements, staff is in agreement with the applicant that the proposed line will not pose a significant hazard to area aviation.

INTERFERENCE WITH RADIO-FREQUENCY COMMUNICATION

The previously noted corona-related communications interference is most commonly caused by irregularities (such as nicks and scrapes on the conductor surface), sharp edges on suspension hardware and other irregularities around the conductor surface. Calpine/Bechtel's intended use of a low-corona conductor design and construction methods (Calpine/Bechtel 1999a, AFC pages 5-14 and 5-15) should minimize the potential for such interference which is usually of concern only for lines of 345 kV and above. No significant communications interference is expected, as with the existing 230 kV line to which the proposed line will be connected. This is as staff would expect for this type of line. The previously noted provisions of the related FCC regulations are important in requiring each project owner to ensure mitigation of any such interference to the satisfaction of the affected individual. Staff has proposed a condition of certification (**TLSN-2**) to

ensure mitigation of any interference-related complaints on a case-specific basis, as required by the FCC. **TLSN-1** is also proposed by staff to ensure compliance with GO-52, also intended to prevent radio interference.

AUDIBLE NOISE

As with radio noise, the low-corona conductor proposed for the MEC line and currently used in the 230 kV line to which it will be connected, will minimize the potential for audible noise. This means, as noted by Calpine/Bechtel (1999a, AFC page 5-15), that the line will not add significantly to existing background noise levels in the area. For an assessment of the noise from all phases of the proposed power plant and related facilities, please refer to staff's analysis in the **Noise** section.

FIRE HAZARDS

According to Calpine/Bechtel, adequate fire prevention and suppression measures will be implemented in the area around the proposed line as required by related regulations and industry practices (Calpine/Bechtel 1999a, AFC page 5-15). Compliance with GO 95 requirements will ensure the clearance necessary to prevent fires from direct contact between the proposed line, trees and other objects. Compliance with condition of certification **TLSN-4**, as staff proposes, will prevent accumulation of combustible materials that could contribute to such fires.

HAZARDOUS SHOCKS

Calpine/Bechtel has stated their intention to comply with the requirements of GO-95 intended to prevent hazardous shocks from direct or indirect human contact with the overhead energized line. Therefore, they do not expect the proposed line to pose any such hazards to humans (Calpine/Bechtel 1999a, AFC page 5-8). Staff does not expect such a hazard from the line as proposed and recommends a condition of certification (**TLSN-1**) to ensure implementation of the necessary GO-95-related measures.

NUISANCE SHOCKS

Calpine/Bechtel intends to minimize the potential for nuisance shocks by ensuring the grounding of all metallic object within or near the right-of-way way as with the same-voltage line to which it will be connected (Calpine/Bechtel 1999a, AFC page 5-14). Ensuring GO-95-required ground clearance, as intended by Calpine/Bechtel (1999a, AFC page 5-13), will minimize the potential for the electrical charging for which such grounding would be necessary. Staff recommends a specific condition of certification (**TLSN-5**) to ensure the necessary grounding.

ELECTRIC AND MAGNETIC FIELD EXPOSURE

Calpine/Bechtel intends to implement PG&E's EMF reduction measures arising from CPUC Decision 93-11-013. Staff is satisfied with the related details as provided by Calpine/Bechtel along with the underlying design assumptions (Calpine/Bechtel 1999a, AFC pages 5-12 through 5-14). Calpine/Bechtel also calculated the maximum field strengths at the interconnection point of maximum impact to reflect the maximum contribution of the proposed line to total field strengths, as contributed by the proposed line and the other five lines within the

existing corridor. This calculation was made to reflect the interactive effects of fields from the proposed line and the other lines. The results show that the proposed line design will not contribute significantly to existing electric or magnetic field levels within the PG&E right-of-way through which the MEC power will be transmitted. Staff has established the appropriateness of Calpine/Betchel's calculation approach with respect to parameters bearing on field strength and dissipation, and exposure assessment.

Specifically, Calpine/Bechtel's calculations show that line operations will not change the existing field strength of .075 kV/m at the edge of the left side and the 2.044 kV/m on the right side of the right-of-way. For magnetic fields, the existing strength of 5.381 mG at the south side of the right-of-way will increase to 5.847 mG under conditions of maximum impact. However, line operations will reduce field strengths on the northern side from about 40.728 mG to 32.656 mG because of a corresponding reduction in system power flow through the 500 kV line on the northern side of the right-of-way.

As previously noted, the most important human exposures in the line's impact area will be the short-term exposures to utility workers in the course of their duties around the line and individuals in transit across the right-of-way. Such short-term exposures are well understood, being significantly lower than exposures from the use of common household appliances, such as hair dryers, toaster ovens, microwave ovens and electric shavers. They are not known to have produced any significant health impacts in the past. Staff has recommended condition of certification **TLSN-3** to verify that the fields are reduced to the extent proposed by Calpine/Bechtel. Condition of certification **TLSN-5** is proposed to ensure the measures necessary to prevent any field-related nuisance shocks along the route.

CUMULATIVE IMPACTS

The strengths of electric and magnetic fields from the proposed line were calculated to factor the interactive effects of fields from nearby lines. These calculated field strength values, therefore, reflect the cumulative exposure of an individual to fields from all lines within the impact area of the proposed line. They are typical of similar lines within the PG&E service area.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

Since electric or magnetic field health effects have neither been established nor ruled out for lines such as those proposed for this project, the public health significance of any project-related field exposure cannot be characterized with certainty. The short-term exposures associated with the proposed and the other lines in its field impact area are typical of similar PG&E lines. The long-term residential magnetic exposure primarily at the root of the present health concern will be insignificant in the case of the proposed MEC line because there are no nearby residents. Any nuisance shocks from the lines will be minimized through grounding and other measures to be implemented by Calpine/Bechtel in compliance with GO-

95, Title 8, Section 2700 et seq. of the California Code of Regulations, and the applicable PG&E field-reducing guidelines. Since the line will be located away from all area airports, any hazard to area aviation will be small. The use of low-corona conductors together with an appropriate line maintenance program will minimize the potential for interference with radio-frequency communication.

RECOMMENDATIONS

Since the proposed 230 kV transmission line will be designed according to the applicable safety and field-reducing guidelines, and routed over a relatively short distance to the existing power grid, staff recommends its approval for the route proposed. If such approval is granted, staff recommends that the Commission adopt the following conditions of certification to ensure implementation of the measures necessary to achieve the field levels assumed by Calpine/Bechtel for the line design.

CONDITIONS OF CERTIFICATION

TLSN-1 The project owner shall construct the proposed transmission line according to the requirements of GO-95, GO-52, Title 8, Group 2., High Voltage Electrical Safety Orders Section 2700 through 2974 of the California Code of Regulations and PG&E's EMF-reduction measures arising from CPUC Decision 93-11-013.

Verification: Thirty days before start of transmission line construction, the project owner shall submit to the Commission's Compliance Project Manager (CPM) a letter signed by a California registered electrical engineer affirming that the transmission line will be constructed according the requirements of GO-95, Title 8, Section 2700 et seq. of the California Code of Regulations and PG&E's EMF reduction measures arising from CPUC Decision 93-11-013.

TLSN-2 The project owner shall make every reasonable effort to identify and correct, on a case-specific basis, any complaints of interference with radio or television signals from operation of the line and related facilities. In addition to any transmission repairs, the relevant corrective actions should include, but shall not be limited to, adjusting or modifying receivers, repairing, replacing or adding antennas, signal amplifiers, filters, or lead-in cables.

The project owner shall maintain written records for a period of five years, of all complaints of radio or television interference attributable to operation together with the corrective action taken in response to each complaint. All complaints shall be recorded to include notations on the corrective action taken. Complaints not leading to a specific action, or for which there was no resolution should be noted and explained. The record shall be signed by the project owner and also the complainant, if possible, to indicate concurrence with the corrective action or agreement, with the justification for a lack of action. The complaint form specified under the General Conditions of Certification shall be used for this purpose.

Verification: All reports of line-related complaints shall be summarized and included for five years in the Annual Compliance Report to the CPM.

TLSN-3 The project owner shall engage a qualified consultant to measure the strengths of the line electric and magnetic fields in the project owner's 240-foot section before and after the 230 kV line is energized. Measurements should be made at the same point for which field strength values were presented by Calpine/Bechtel in the AFC. Measurements should also be made to identify the electric and magnetic fields from the line in the area along the route away from the influence of fields from the other five lines within the existing PG&E corridor. The areas to be measured should include the facility switchyard.

Verification: The project owner shall file copies of the pre-and post-energization measurements with the CPM within 60 days after completion of the measurements. These measurements shall be completed within 6 months of the start of operations.

TLSN-4 The project owner shall ensure that the transmission line right-of-way is kept free of combustible material, as required under the provisions of Section 4292 of the Public Resources Code and Section 1250 of Title 14 of the California Code of Regulations.

Verification: The project owner shall provide a summary of inspection results and any fire prevention activities carried out along the right-of-way, for five years, in the annual compliance report.

TLSN-5 The project owner shall ensure the grounding of any ungrounded permanent metallic objects within the right-of-way of the overhead section, regardless of ownership. Such objects shall include fences, gates, and other large objects. These objects shall be grounded according to procedures specified in the National Electrical Safety Code.

Protocol:

Protocol: Protocol: In the event of a refusal by any property owner to permit such grounding, the project owner shall so notify the CPM. Such notification shall include, when possible, the owner's written objection. Upon receipt of such notice, the CPM may waive the requirement for grounding the object involved.

Verification: At least 30 days before the line is energized, the project owner shall transmit to the CPM a letter confirming compliance with this condition.

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HAZARDOUS MATERIALS MANAGEMENT

Testimony of Rick Tyler and Alvin Greenberg, Ph.D.

INTRODUCTION

The purpose of this analysis is to determine if the proposed Metcalf Energy Center (MEC) (Calpine/Bechtel, 1999a) has the potential to cause significant impact on the public as a result of the use, handling or storage of hazardous materials at the proposed facility. If significant adverse impacts on the public are identified, Energy Commission staff must also evaluate the potential for facility design alternatives and additional mitigation measures to reduce impacts to the extent feasible.

This analysis does not address potential exposure of workers to hazardous materials used at the proposed facility. Employers must inform employees of hazards associated with their work and thus employees accept a higher level of risk than the general public as a condition of employment. Workers are thus not afforded the same level of protection normally provided to the public. Further, workers can be provided with special protective equipment and training to reduce the potential for health impacts associated with the handling of hazardous materials. Staff's **Worker Safety and Fire Protection** analysis also describes the requirements applicable to the protection of workers from such risks.

The only hazardous material stored at the MEC in quantities exceeding the reportable amounts defined in the California Health and Safety Code, section 25532 (j), is aqueous ammonia (25 to 30% ammonia in aqueous solution). The use of aqueous ammonia significantly reduces the risk that would be associated with use of the more economical anhydrous form of ammonia. Use of the aqueous form eliminates the high internal energy associated with the more hazardous anhydrous form, which is stored as a liquefied gas at elevated pressure. The high internal energy associated with the anhydrous form of ammonia can act as a driving force in an accidental release which can rapidly introduce large quantities of the material to the ambient air, where it can be transported in the atmosphere and result in high down-wind concentrations. Spills associated with the aqueous form are much easier to contain and emissions are limited by the slow mass transfer from the free surface of the spilled material.

Other hazardous materials stored in smaller quantities, such as mineral and lubricating oils, corrosion inhibitors and water conditioners, will be present at the proposed facility. However, these materials pose no significant potential for off-site impacts as a result of the quantities on site, their relative toxicity, and/or their environmental mobility. Although no natural gas is stored, the project will also involve the construction and operation of a natural gas pipeline and handling of large amounts of natural gas. Natural gas poses some risk of both fire and explosion. The natural gas pipeline is addressed here and in staff's **Facility Design** analysis.

The MEC will also require the transportation of aqueous ammonia to the facility. Analysis of the potential for impact associated with such deliveries is addressed below.

LAWS, ORDINANCES, REGULATIONS, STANDARDS AND POLICIES

The following federal, state, and local laws and policies apply to the protection of public health and hazardous materials management. Staff's analysis examines the project's compliance with these requirements.

FEDERAL

The Superfund Amendments and Reauthorization Act of 1986 (SARA) Title III and Clean Air Act of 1990 established a nationwide emergency planning and response program and imposed reporting requirements for businesses which store, handle, or produce significant quantities of extremely hazardous materials. The Act (codified in 40 C. F. R., § 68.110 et seq.) requires the states to implement a comprehensive system to inform local agencies and the public when a significant quantity of such materials is stored or handled at a facility. The requirements of these Acts are reflected in the California Health and Safety Code, section 25531 et seq.

STATE

The California Health and Safety Code, section 25534, directs facility owners, storing or handling acutely hazardous materials in reportable quantities, to develop a Risk Management Plan (RMP) and submit it to appropriate local authorities, the United States Environmental Protection Agency (EPA), and the designated local Administering Agency for review and approval. The plan must include an evaluation of the potential impacts associated with an accidental release, the likelihood of an accidental release occurring, the magnitude of potential human exposure, any preexisting evaluations or studies of the material, the likelihood of the substance being handled in the manner indicated, and the accident history of the material. This new, recently developed program supersedes the California Risk Management and Prevention Plan (RMPP).

Title 8, California Code of Regulations, Section 5189, requires facility owners to develop and implement effective safety management plans to insure that large quantities of hazardous materials are handled safely. While such requirements primarily provide for the protection of workers, they also indirectly improve public safety and are coordinated with the RMP process.

Title 8, California Code of Regulations, Section 458 and Sections 500 – 515, set forth requirements for design, construction and operation of vessels and equipment used to store and transfer anhydrous ammonia. These sections generally codify the requirements of several industry codes, including the ASME Pressure Vessel Code, ANSI K61.1 and the National Boiler and Pressure Vessel Inspection Code. While these codes apply to anhydrous ammonia, they may also be used to design storage facilities for aqueous ammonia.

California Health and Safety Code, section 41700, requires that “No person shall discharge from any source whatsoever such quantities of air contaminants or other material which causes injury, detriment, nuisance, or annoyance to any considerable number of persons or to the public, or which endanger the comfort, repose, health, or safety of any such persons or the public, or which cause, or have a natural tendency to cause injury or damage to business or property.”

GAS PIPELINE

The safety requirements for pipeline construction vary according to the population density and land use, which characterize the surrounding land. The pipeline classes are defined as follows (Title 49, Code of Federal Regulations, Part 192):

- Class 1: Pipelines in locations with ten or fewer buildings intended for human occupancy.
- Class 2: Pipelines in locations with more than ten but fewer than 46 buildings intended for human occupancy. This class also includes drainage ditches of public roads and railroad crossings.
- Class 3: Pipelines in locations with more than 46 buildings intended for human occupancy, or where the pipeline is within 100 yards of any building or small well-defined outside area occupied by 20 or more people on at least 5 days a week for 10 weeks in any 12 month period (The days and weeks need not be consecutive).

The natural gas pipeline will be designed for Class 3 service and will meet California Public Utilities Commission General Order 112-D and 58-A standards as well as various PG&E standards. The natural gas pipeline must be constructed and operated in accordance with the Federal Department of Transportation (DOT) regulations, Title 49, Code of Federal Regulations (CFR), Parts 190, 191, and 192:

- Title 49, Code of Federal Regulations, Part 190 outlines the pipeline safety program procedures;
- Title 49, Code of Federal Regulations, Part 191, Transportation of Natural and Other Gas by Pipeline; Annual Reports, Incident Reports, and Safety-Related Condition Reports, requires operators of pipeline systems to notify the U.S. Department of Transportation of any reportable incident by telephone and then submit a written report within 30 days;
- Title 49, Code of Federal Regulations, Part 192, Transportation of Natural and Other Gas by Pipeline: Minimum Federal Safety Standards, specifies minimum safety requirements for pipelines and includes material selection, design requirements, and corrosion protection. The safety requirements for pipeline construction vary according to the population density and land use which characterize the surrounding land. This part contains regulations governing pipeline construction, which must be, followed for Class 2 and Class 3 pipelines.

LOCAL AND REGIONAL

The Uniform Fire Code (UFC) contains provisions regarding the storage and handling of hazardous materials. These provisions are contained in Articles 79 and 80. The latest revision to Article 80 was in 1997 (UFC, 1997). These articles contain minimum setback requirements for outdoor storage of ammonia.

The California Building Code contains requirements regarding the storage and handling of hazardous materials. The Chief Building Official must inspect and verify compliance with these requirements prior to issuance of an occupancy permit. A further discussion of these requirements is provided in the **Facility Design** portion of this document.

SETTING

The proposed project is located in an area with mixed land uses. Hazardous materials use and transportation are associated with many of the commercial, industrial and agricultural activities in the area. Both anhydrous and aqueous forms of ammonia are commonly used as a fertilizer and are frequently associated with agricultural activities in Coyote Valley and surrounding areas. Thus, hazardous materials are commonly transported, stored, and used in the project vicinity.

Several factors associated with the area in which a project is to be located affect its potential to cause public health impacts from an accidental release of a hazardous material. These include:

- local meteorology;
- terrain characteristics, and;
- location of population centers and sensitive receptors relative to the project.

METEOROLOGICAL CONDITIONS

Meteorological conditions, including wind speed, wind direction and air temperature, affect the extent to which accidentally released hazardous materials would be dispersed into the air and the direction in which they would be transported. This affects the level of public exposure to such materials and the associated health risks. When wind speeds are low and stable, dispersion is severely reduced and can lead to increased localized public exposure.

Recorded wind speeds and ambient air temperatures are described in the air quality section of the AFC (Calpine/Bechtel 1999a, AFC Chapter 8.1). This data indicates that wind speeds below one meter per second and temperatures exceeding 80°F occur in the project area. Therefore, staff suggested that the applicant use F stability (stagnated air, very little mixing), one meter/second wind speed and an ambient temperature of 80°F in its modeling analysis of an accidental release to reflect worst case atmospheric conditions. These conditions were reflected in the modeling used to estimate the potential worst case impacts associated with an accidental ammonia release. Additional modeling of more likely accident scenarios and more realistic meteorological conditions were also evaluated.

TERRAIN CHARACTERISTICS

The location of elevated terrain (terrain above the power plant stack height) is often an important factor to be considered in assessing potential exposure. An emission plume resulting from an accidental release may impact high elevations before impacting lower elevations. Modeling of an accidental release of aqueous ammonia at the proposed facility indicates that significant concentrations would be confined to the facility property and that off-site concentrations – even at elevated locations – would be so low as to pose no hazard to the public. Thus, elevated terrain is not an important factor effecting the modeled results of accidental releases of aqueous ammonia at this site.

LOCATION OF EXPOSED POPULATIONS AND SENSITIVE RECEPTORS

The general population includes many sensitive subgroups that may be at greater risk from exposure to emitted pollutants. These sensitive subgroups include the very young, the elderly, and those with existing illnesses (Calabrese 1978). In addition, the location of the population in the area surrounding a project site may have a large bearing on health risk. Figure 8.12-1a and b (Calpine/Bechtel 1999a) shows the locations of both populated areas and sensitive receptors in the project vicinity.

ENVIRONMENTAL IMPACTS

A thorough review and assessment of the potential for the transportation, handling, and use of hazardous materials to impact on the surrounding community was made by staff. All chemicals and natural gas were evaluated.

METHODOLOGY

In order to assess the potential for released hazardous materials to travel off-site, and impact on the public, staff analyzed several aspects of the proposed use of these materials at the facility. Staff recognizes that some chemicals must be used that are toxic. Therefore, staff conducted its analysis by examining the need for hazardous materials, the choice of chemical to be used and its amount, the manner in which the applicant will use the chemical, the manner it will be transported to the facility and transferred to facility storage tanks, and the way the applicant chooses to store the material on site. Staff reviewed the applicant's proposed engineering controls and administrative controls concerning hazardous materials usage.

Engineering controls are those physical or mechanical systems (such as storage tanks or automatic shut-off valves) which can prevent a spill of hazardous material from occurring or which can limit the spill to a small amount or confine it to a small area. Administrative controls are those rules and procedures, that workers at the facility must follow that will help to prevent accidents or keep them small if they do occur. Both engineering and administrative controls can act as methods of prevention or as methods of response and minimization. In both cases, the goal is to prevent a spill from moving off site and causing harm to people.

Staff conducted a thorough review and evaluation of the applicant's proposed use of hazardous materials as described by the applicant in the AFC (Section 8.12) and in data responses. Staff's assessment followed the five steps listed below:

- Step 1: Staff reviewed the chemicals and the amounts proposed for use as listed in Table 8.12-3 of the AFC and determined the need and appropriateness of their use. If less toxic materials are available, staff suggested their use instead.
- Step 2: Those chemicals, proposed for use in small amounts or whose physical state is such that there is virtually no chance that a spill would migrate off the site and impact the public, were removed from further assessment.
- Step 3: Measures proposed by the applicant to prevent spills were reviewed and evaluated. These included engineering controls such as automatic shut-off valves and different size transfer-hose couplings and administrative controls such as worker training and safety management programs.
- Step 4: Measures proposed by the applicant to respond to accidents were reviewed and evaluated. These measures also included engineering controls such as catchment basins and methods to keep vapors from spreading and administrative controls such as training emergency response crews.
- Step 5: Staff then analyzed the impacts on the public that would be associated with a worst-case spill of hazardous materials occurred in the absence of mitigating circumstances. This analysis was also repeated, but including the applicant's proposed methods of containment and clean up were included (termed "mitigation" methods). If the mitigation methods proposed by the applicant are found to be insufficient to reduce the potential for adverse impacts to an insignificant level, staff may propose additional prevention and response controls until the chances for causing harm to the public were reduced to insignificant levels. It is only at this point that staff can recommend that the facility be allowed to use hazardous materials.

PROJECT IMPACTS

In conducting the analysis, staff determined in Steps 1 and 2 that some materials, although present at the proposed facility, pose a minimal potential for off-site impacts as they will be stored in a solid form or in smaller quantities or have very low toxicity. These hazardous materials were thus removed from further assessment. Scale inhibitors are used to control and reduce the potential for scale and corrosion to form within the pipeline system. This group of chemicals includes the NALCO series of solutions, di- and tri-sodium phosphate, organophosphonic acid, and sodium tolyltriazole. These chemicals are safer to use than others often used at other facilities for this purpose, such as hydrazine, and the applicant has thus chosen the most appropriate substitute. Staff has determined that the potential for impacts on the public are insignificant if the applicant uses those scale inhibitors and corrosion controllers that contain only the active ingredients on the list. See Appendix C for a list of chemicals that will be used at the power plant.

It was also determined that even though large quantities of sodium hydroxide and sulfuric acid will be used and stored on site, these materials would not pose a risk of

off-site impacts as a result of a direct release because they have relatively low vapor pressures and thus spills will be confined to the site. Because of public concern at another proposed energy facility in 1995, staff conducted a quantitative assessment of the potential for impact associated with sulfuric acid use, storage, and transportation and found no hazard would be posed to the public. However, in order to assure that the sulfuric acid storage area will be free from risk of fire, an additional Condition of Certification (see condition of Certification Haz-10) will require that the project owner shall ensure that no combustible or flammable material is stored, used, or transported within 100 feet of the sulfuric acid tank.

The aqueous mixture of sodium hypochlorite will likewise have a low potential to affect the off site public because its vapor pressure is also low and the concentration of hypochlorite is low (10 percent). In fact, hypochlorite is used at many such facilities as a substitute for chlorine gas, which is much more toxic and much more likely to migrate off site because it is a gas and is stored in concentrated form. Thus, the use of a water solution of sodium hypochlorite is itself a mitigation measure. However, accidental mixing of sodium hypochlorite with acids could result in toxic gases. Thus, measures to prevent such mixing are extremely important.

The use of aqueous ammonia can also result in the formation and release of toxic gases in the event of a spill even without interaction with other chemicals. This is a result of its relatively high vapor pressure and the large amounts of aqueous ammonia, which will be used and stored on site. However, as with aqueous hypochlorite, the use of aqueous ammonia instead of the much more hazardous anhydrous ammonia (i.e. ammonia that is not diluted with water) is itself a form of mitigation.

The use of natural gas can result in fires and/or explosion. While the risk of on site natural gas accidents can be minimized, concern exists about the transfer of natural gas via pipelines, which are buried beneath the surface near the surrounding neighborhood.

Finally, the proposed temporary use of large quantities of Hydrochloric Acid (HCl) for cleaning of the Heat Recovery Steam Generator (HRSG) every three to five years poses a minimal hazard.

Based on the screening analysis discussed above, aqueous ammonia and natural gas are the only hazardous materials that may pose a risk of off-site impacts. The following is a project specific analysis of the potential impacts associated with the handling of each of these materials.

AQUEOUS AMMONIA AT THE SITE

Aqueous ammonia will be used in controlling the emission of oxides of nitrogen (NOx) from the combustion of natural gas in the facility. The accidental release of aqueous ammonia without proper mitigation can result in hazardous down-wind concentrations of ammonia gas.

To assess the potential impacts associated with an accidental release of ammonia, staff typically evaluates where four “bench mark” exposure levels of ammonia gas occur off-site. These include: 1) the lowest concentration posing a risk of lethality, 2,000 ppm; 2) the Immediately Dangerous to Life and Health (IDLH) level of 300 ppm; 3) the Emergency Response Planning Guideline (ERPG) level 2 of 200 ppm, which is also the RMP level 1 criterion used by EPA and California; and 4) the level considered by the Energy Commission staff to be without serious adverse effects on the public for a one-time exposure of 75 ppm. (A detailed discussion of the exposure criteria considered by staff and their applicability to different populations and exposure-specific conditions is provided in Appendix A of this analysis.) If the potential exposure associated with a potential release exceeds 75 ppm at any public receptor, staff will presume that the potential release poses a risk of significant impact. However, staff may also assess the probability of occurrence of the release and/or the nature of the potentially exposed population. Staff may, based on such analysis, determine that the likelihood and extent of potential exposure are not sufficient to support a finding of potentially significant impact.

Calpine/Bechtel’s Response to Staff Data Request 48 provided the results of modeling for a worst case accidental release of aqueous ammonia. The worst-case release scenario is associated with a postulated spontaneous catastrophic storage tank failure. In conducting this analysis, it was assumed that spilled material would be contained in the covered basin below the storage vessel and that winds of 1.0 meters per second and category F stability would exist at the time of the accidental release. This screening analysis was designed to predict the maximum possible impacts based on distance from the storage tank without regard to specific direction of transport. This analysis indicated that concentrations exceeding 75 PPM would be confined to the project site.

TRANSPORT OF AQUEOUS AMMONIA

The transportation of hazardous materials to the facility is of great concern by the residents and workers in the surrounding community. Concern over the potential for an accident involving a delivery vehicle and a resultant chemical spill has been expressed. Hazardous materials including aqueous ammonia, sulfuric acid, and sodium hypochlorite will be transported to the facility via tanker truck. While many types of hazardous materials will be transported to the site it is staff’s belief that transport of aqueous ammonia poses the predominance of risk associated with such transport.

Aqueous ammonia can be released during transportation of this chemical to the facility. Aqueous ammonia would be delivered to the Metcalf facility by tanker truck. If aqueous ammonia is released from a delivery vehicle during transport, it can result in hazardous ambient concentrations. The extent of impact in the event of such a release would depend on the location and on the rate of dispersion of ammonia vapor from the surface of the aqueous ammonia pool. The likelihood of an accidental release during transport is dependent on accident rates, the type of vehicle used for transport and on the skill of the drivers utilized.

To address concerns raised during workshops staff evaluated the risk of accidental release in the project area. Staff's analysis focused on the project area after the delivery vehicle leaves the main highway. To address the issue of driver competence, staff believes that it is appropriate to rely on the extensive regulatory program that applies to shipment of hazardous materials on California Highways to ensure safe handling in general transportation.

To address the issue of tank truck safety, aqueous ammonia will be delivered to the proposed facility in Department of Transportation (DOT) certified vehicles with design capacity of 7,500 gallons. These vehicles will be designed to DOT Code MC-307. These are high integrity vehicles designed for hauling of caustic materials such as ammonia. In fact, in response to staff's data request for more information regarding ammonia transport truck specifications, the Applicant provided the tanker truck specifications obtained from the manufacturer for transport vehicles which would be used to transport aqueous ammonia. Staff has therefore proposed an additional Condition of Certification (Haz-11) to ensure that regardless of which vendor supplies the aqueous ammonia, delivery will be made in a tanker which meets or exceeds the specifications described by the Applicant.

To address the issue of accident rates staff determined that the frequency of release for transportation of hazardous materials in the U.S. is between 0.06 and 0.19 releases per million miles traveled on well designed roads and highways (Davies and Lees 1992). The same source provides estimates of the probability that such an event will occur at random in a location where a large number of people would be present and exposed within a large urban environment. It is estimated that about 8.9 percent of such incidents would involve more than 10 people and that less than 1.4 percent would involve more than 33 people. Thus the maximum risk of an accident exposing more than 10 people is about 0.018 (0.19×0.089) in one million per tanker mile traveled. The maximum risk of such an accident exposing 100 or more people is less than 0.0027 (0.19×0.014) in one million per tanker mile traveled. This does not include any mitigating affect resulting from meteorological conditions existing at the time of the event that frequently result in rapid dispersion of released materials mitigating potential impacts.

Assuming maximum continuous usage of aqueous ammonia each year operation of the proposed Metcalf facility will require about 100 tank truck deliveries of aqueous per year. Each truck delivery will travel about 10 miles loaded between Highway 101 and the facility per year resulting in 1,000 miles of delivery truck travel in the project area per year. Thus, the maximum risk of accidental release and potential exposure of more than 10 people in the project area is less than 17 in one million per year and the risk of exposing more than 100 people is less than 2.7 in one million (.00027% risk).

Staff uses a significance threshold of 1 in 100,000 for risk of 10 exposures and a threshold of 1 in 1,000,000 for risk of 100 exposures (.0001% risk). The risk estimate of 2.7 in one million exceeds the 1 in 1,000,000 criteria (.0001% risk). However, this estimate is based on a screening level of analysis. The analysis does not include assessment of the probability of an actual impact in the event of a release. Such an analysis would also include probability of pessimistic dispersion

and atmospheric transport in the direction of receptors. The analysis also used the upper end (0.19 in one million) of the accidental release rate per mile of travel. The range of this rate is from 0.06 to 0.19 in one million. Considering these factors staff does not believe that the actual risk of ammonia release and impact on 100 people exceeds 1 in 1,000,000 (.0001% risk).

Staff believes the risk of exposure to significant concentrations of aqueous ammonia during transportation to the facility are insignificant because of the remote possibility of accidental release of a sufficient quantity to present a danger to the public. The transportation of similar volumes of hazardous materials on the nation's highways is not unique nor an infrequent occurrence. In fact, the people of San Jose encounter hazardous materials transport every day of their lives while engaging in normal activities. People are frequently in the "area" and/or in close "proximity" to these hazardous materials shipments and yet are almost never effected by them. These shipments include hazardous materials far more dangerous (toxic, corrosive or flammable) than aqueous ammonia. In general people feel more comfortable with the risks associated with transportation and use more commonly encountered hazardous materials such as gasoline. This is because they are more familiar with it and comfortable in the knowledge that the risk of accident is small. They also have better knowledge of the potential magnitude of adverse impacts. Staff's analysis of the transportation of aqueous ammonia to the proposed facility demonstrates that the risk of accident and exposure is far less than those associated with many activities that the public readily accepts.

Based on the environmental mobility, toxicity, quantities present at the site and frequency of delivery, it is staff's opinion that aqueous ammonia poses the predominate risk associated with hazardous materials transportation and use at the proposed facility. Based on this, staff concludes that the risk associated with transportation of other hazardous materials to the proposed facility does not significantly increase the risk of impact beyond that associated with ammonia transportation.

NATURAL GAS

Natural gas, poses a fire and/or explosion risk as a result of its flammability. Natural gas is composed of mostly methane but also contains ethane, propane, nitrogen, butane, isobutane and isopentane. It is colorless, odorless, and tasteless and is lighter than air. Natural gas can cause asphyxiation when methane is ninety percent in concentration. Methane is flammable when mixed in air at concentrations of 5 to 14 percent, which is also the detonation range. Natural gas, therefore, poses a risk of fire and/or explosions if a release were to occur. However, it should be noted that natural gas is less likely to cause explosions than many other fuel gases, such as propane or liquefied petroleum gas due to its tendency to disperse rapidly (Lees 1983).

While natural gas will be used in significant quantities, it will not be stored on site. The risk of a fire and/or explosion on site can be reduced to insignificant levels through adherence to applicable codes and development and implementation of

effective safety management practices. In particular, gas explosions can occur in the Heat Recovery Steam Generator (HRSG) and during start-up. NFPA 85A requires 1) the use of double block and bleed valves for gas shut-off; 2) automated combustion controls; and 3) burner management systems. These measures will significantly reduce the likelihood of an explosion in gas fired equipment. Additionally, start-up procedures will require air purging of the gas turbines prior to start-up, thus precluding the presence of an explosive mixture. The safety management plan proposed by the applicant will address the handling and use of natural gas and significantly reduce the potential for equipment failure due to improper maintenance or human error.

The facility will also require the installation of a one-mile natural gas pipeline that could result in an accidental release of natural gas. The design of the natural gas pipeline is governed by laws and regulations discussed here and in staff's **Facility Design** analysis. These LORS require use of high quality arc welding techniques by certified welders and inspection of welds. Many failures of older natural gas lines have been associated with poor quality gas welds. Many failures in older pipelines have also resulted from corrosion. Current codes address this failure mode by requiring use of corrosion resistant coatings and cathodic corrosion protection. Another major cause of pipeline failure is damage resulting from excavation activities near pipelines. Current codes address this mode of failure by requiring clear marking of the pipeline route. An additional mode of failure particularly relevant to the project area is damage caused by earthquake. Existing codes also address seismic hazard in design criteria (see discussion below). Evaluation of pipeline performance in recent earthquakes indicates that pipelines designed to modern codes perform well in seismic events while older lines frequently fail. Staff believes that existing regulatory requirements are sufficient to reduce the risk of accidental release from the pipeline to insignificant levels.

Failures of gas pipelines, according to data from the U.S. Department of Transportation (the National Transportation Safety Board) from the period 1984 - 1991, occur as a result of pipeline corrosion, pipeline construction or materials defects, rupture by heavy equipment excavating in the area such as bulldozers and backhoes, weather effects, and earthquakes. Given the gas line failures which occurred in the Marina District of San Francisco during the 1989 Loma Prieta earthquake, the January 1994 Northridge earthquake in Southern California, and the January 1995 gas pipeline failures in Kobe, Japan, as well as the January 19, 1995 gas explosion in San Francisco, the safety of the gas pipeline is of paramount importance. However, it must be noted that those pipelines, which failed, were older and not manufactured nor installed to modern code requirements.

The natural gas pipeline for the proposed facility will be installed by Calpine and built to PG&E specifications. The pipeline will be 16 inches in diameter. The pipeline will be tested and designed for 900 pounds per square inch (psig) pressure but will be operated at a maximum pressure of 600psig. If loss of containment occurs as a result of pipe, valve, or other mechanical failure or external forces, significant quantities of compressed natural gas could be released rapidly. Such a release can result in a significant fire and/or explosion hazard, which could cause loss of life and/or significant property damage in the vicinity of the pipeline route.

However, the probability of such an event is extremely low if the pipeline is constructed according to present standards.

According to DOT statistics, the frequency of reportable incidents is about 0.25 for all pipeline incidents per 1,000 miles per year or 2.5×10^{-4} incidents per mile per year (SERA 1993). DOT has also evaluated and categorized the major causes of pipeline failure. To summarize, the four major causes of accidental releases from natural gas pipelines are: Outside Forces-43 percent, Corrosion-18 percent, Construction/Material Defects-13 percent, and Other-26 percent.

Outside forces are the primary causes of incidents. Damage from outside forces includes damage caused by use of heavy mechanical equipment near pipelines (e.g., bulldozers and backhoes used in excavation activities), weather effects, vandalism, and earthquake-caused rupture as seen in the Marina District of San Francisco during the 1989 Loma Prieta Quake and in Kobe, Japan in January 1995. The fourth category, "Other" includes equipment component failure, compressor station failures, operator errors and sabotage. The average annual service incident frequency for natural gas transmission systems varies with age, the diameter of the pipeline, and the amount of corrosion.

Older pipelines have a significantly higher frequency of incidents. This results from the lack of corrosion protection and use of less corrosion resistant materials compared to modern pipelines, limited use of modern inspection techniques, and higher frequency of incidents involving outside forces. The increased incident rate due to outside forces is the result of the use of a larger number of smaller diameter pipelines in older systems, which are generally more easily damaged and the uncertainty regarding the locations of older pipelines. (See Condition of Certification HAZ-6)

In the United States, extensive federal and state pipeline codes and safety enforcement minimize the risk of severe accidents related to natural gas pipelines. DOT has reported that from 1970 to 1992, with 300,000 miles of natural gas pipelines in service, there were 6,500 incidents, 565 injuries, 95 fatalities, and over \$140 million in property damage associated with natural gas pipelines.

Thus, the following safety features will be incorporated into the design and operation of the natural gas pipeline: (1) while the pipeline will be designed and constructed, and tested to carry natural gas at a pressure of 600 psig, the working pressure will be 400 psig; (2) butt welds will be X-rayed and the pipeline will be tested with water prior to the introduction of natural gas into the line; (3) the pipeline will be surveyed for leakage annually (4) the pipeline will be marked to prevent rupture by heavy equipment excavating in the area; and (5) valves at the meter will be installed to isolate the line if a leak occurs. (See Condition of Certification HAZ-7 and-9)

HAZARDOUS MATERIALS SAFETY MANAGEMENT AND SPILL RESPONSE

The potential for accidents resulting in the release of hazardous materials is greatly reduced by the implementation of a safety management program, which includes the use of engineering and administrative controls. Administrative controls include the development and implementation of a Safety Management Plan. Elements of facility controls and the safety management plan are summarized below.

ENGINEERING CONTROLS

Engineering controls help to prevent accidents and releases (spills) from moving off-site and impacting on the community by incorporating engineering safety design criteria into the design of the facility. The engineered safety features at this facility include:

- construction of dikes, berms, and/or catchment basins in the hazardous materials storage areas to contain accidental releases that might happen during storage or delivery;
- physical separation of stored chemicals in separate containment areas in order to prevent accidental mixing of incompatible materials which may result in the evolution and release of toxic gases or fumes;
- the use of signs and other safety practices to identify the contents of the storage tanks in order to prevent accidental mixing of incompatible materials;
- a fire protection system to detect and suppress fires and to sound alarms, and;
- process protective systems including automatic shut-off valves, relief valves, check valves, and fire protection; drains and vent piping that are trapped and isolated to eliminate leaks and vapors.

ADMINISTRATIVE CONTROLS

Administrative controls also help to prevent accidents and releases (spills) from moving off site and impacting on the community by establishing worker training programs and process safety management programs and by complying with all applicable health and safety laws, ordinances and standards.

The worker health and safety program will include (but is not limited to) the following elements: worker training regarding chemical hazards, health and safety issues, and hazard communication; the proper use of personal protective equipment; safety operating procedures for operation and maintenance of systems utilizing hazardous materials; fire safety and prevention; and emergency response actions including facility evacuation, hazardous material spill cleanup, and fire prevention.

At the facility, the project owner will designate an individual who has the responsibility and authority to ensure a safe and healthful workplace. The project health and safety professional oversees the health and safety program and has the authority to halt any action or modify any work practice in order to protect the workers, facility, and the surrounding community or in the event that the health and safety program is violated.

The facility process safety management program includes a program for the regular inspection and maintenance of equipment, valves, piping, and appurtenances. Additionally, the process safety management program requires that only trained facility personnel are assigned to the transfer and handling of hazardous chemicals.

ON- SITE SPILL RESPONSE

In order to address the issue of spill response, the facility will prepare and implement an Emergency Response Plan which includes information on: hazardous materials contingency and emergency response procedures, spill containment and prevention systems, personnel training, spill notification, on site spill containment, prevention equipment and capabilities, etc. Emergency procedures will be established which include evacuation, spill cleanup, hazard prevention, and emergency response.

SEISMIC ISSUES

Concern exists over the possibility that an earthquake would cause the failure of a hazardous materials storage tank. The quake could also cause the failure of the secondary containment system (berms and dikes) as well as electrically controlled valves, pumps, neutralization systems and the foam vapor suppression system. The failure of all these preventive control measures might then result in a vapor cloud of hazardous materials moving off-site and impacting the residents and workers in the surrounding community. This concern over earthquake safety is heightened by the Loma Prieta earthquake of 1989, the Northridge earthquake of 1994, and the recent earthquake in Kobe, Japan in January 1995.

Information obtained after the January 1994 Northridge earthquake showed that some damage existed to several large storage tanks and smaller tanks associated with the water treatment system of a Cogeneration facility (Glotz 1994). Those tanks with the greatest damage - including seam leakage - were older tanks while the newer tanks sustained displacements and failures of attached lines. Therefore, staff conducted an analysis of the codes and standards, which should be, followed in adequately designing and building storage tanks and containment areas to withstand a large earthquake. Referring to the sections on GEOLOGY and FACILITY DESIGN in the FSA, staff notes that all hazardous material storage tanks will be designed to Uniform Building Code (UBC), American Water Works Association (AWWA), American Society of Mechanical Engineers (ASME), and California Code of Regulations (CCR) Title 8 codes and regulations. In reviewing these codes, staff determined that the hazardous material storage tanks would be constructed to withstand cracking during an earthquake and to withstand overturning or movement off the support structure. The tanks will be attached to the steel-reinforced concrete foundation using steel anchor bolts. This method of attachment will enable the tank to withstand an 8.0 magnitude earthquake without coming loose from the foundation.

Equally important is the safety of the natural gas pipeline, which will be located, subsurface near a residential neighborhood. As stated previously, gas pipelines can fail due to pipeline corrosion, pipeline construction or materials defects, rupture

by heavy equipment excavating in the area such as bulldozers and backhoes, weather effects, and earthquakes.

In the United States, there have been numerous accidental releases of natural gas and subsequent fires resulting in injuries and property damage. Many accidental releases have been the result of damage to pipelines due to earthquakes. One of the factors effecting damage to such pipelines is the potential for liquefaction and surface rupture. The proposed project is located in an area with low potential for liquefaction. However, the most important factor effecting pipeline performance with regard to damage resulting from earthquakes is its design and construction, and most importantly the welding and weld inspection techniques used in constructing the pipeline. More than 95 percent of the accidental releases, which have occurred in California, have been the result of weld failure. The remaining releases were the result of failures at flanges and as the result of corrosion damage, which compromised the pipeline prior to the earthquake.

A recent study was conducted by the National Center for Earthquake Engineering Research which provides an evaluation of pipeline performance in earthquakes which occurred in California between 1933 and 1994 including the Northridge earthquake which occurred in January of 1994 (O'Rourke and Palmer 1994). This study demonstrates that pipelines, which are constructed using modern welding techniques, are not subject to a significant probability of failure because of earthquake. In fact, of the numerous releases documented in this report, not one occurred on pipelines constructed using modern arc welding techniques built to modern codes. In many cases, newer pipelines did not fail, although older lines, located nearby failed. It should also be noted that the report documents incidents of newer lines, which were subject to both severe liquefaction and surface rupture. It can be concluded from this data, that it is unlikely that the pipelines associated with this project would be subject to failure in the event of an earthquake in the project vicinity. It is staff's belief that this data is the most representative available to use in evaluating the proposed pipeline and includes incidences which are representative of potential for surface rupture in the project area.

Because any pipeline constructed for this project must meet or exceed modern codes and standards, it is expected that the gas pipeline would not rupture during an earthquake. In order to ensure safety, staff is proposing two Conditions of Certification requiring that the gas pipeline undergo a complete design review and detailed inspection every 30 years and that after any significant seismic even in the area where surface rupture occurs within one mile of the pipeline, the gas pipeline will be inspected.

CHEMICAL INTERACTIONS

At previous power generation licensing hearings, public concern has been raised over the potential for chemical interactions to occur among the substances emitted from the facility stack and the hazardous materials used and stored at the site (should there be an accidental release). Staff has found, however, that the chances for any chemical interaction are remote and thus the risk of impacts on the public is insignificant. Staff arrived at this conclusion based on several facts. First, although

chemical interactions between the substances are theoretically possible, the very low concentrations (in micrograms of chemical per cubic meter of air) make the probability of reaction remote. Second, the chances of a hazardous material spill resulting in a vapor cloud which would actually meet the emission plume from the facility stack is also remote. And third, spills and stack emissions have been mixing for years at any number of sites in the United States and staff is unaware of a single report documenting any interaction.

Thus, a review of the substances involved revealed that potential chemical reactions could occur between them but only if certain conditions existed. These conditions included weather conditions that caused the co-mingling of the materials in the atmosphere and the presence of a sufficient amount of both chemicals to foster a reaction and generate an amount of new material to be significant. Thus, while it is theoretically possible for new chemicals to form if these materials come into contact with one another, it is extremely doubtful that the resultant amounts of new materials formed would be either detectable or present a hazard to the public.

CUMULATIVE IMPACTS

As proposed, the facility will cause no significant risk of off-site impacts. Thus, the direct impacts of the project will not add to any existing accidental release risks.

MITIGATION

The worst case accidental release scenario evaluated by Calpine/Bechtel assumed that all accidental spills would occur from the storage vessel into the basin below the storage vessel. However, it is more likely that a spill would occur during delivery of ammonia. Such a spill could result in a large pool of aqueous ammonia and significantly higher down wind concentrations of ammonia. Thus, staff proposes a condition of certification requiring a catchment basin be provided between the delivery vehicle and the storage loading connection. This basin would passively drain into the basin below the storage tank or into a separate covered basin capable of containing the entire delivery vehicle's volume.

Staff also proposes a condition requiring development of a safety management plan for delivery of aqueous ammonia. The MEC will not be required to develop and implement a Process Safety Plan pursuant to Title 8. The development of a Safety Management Plan addressing delivery of ammonia will further reduce the risk of any accidental release not addressed by the proposed spill prevention mitigation measures associated with the project and staff's proposed additional mitigation.

FACILITY CLOSURE

The requirements for handling of hazardous materials remain in effect until such materials are removed from the site regardless of facility closure. Therefore, the facility owners are responsible for continuing to handle such materials in a safe manner, as required by applicable laws. In the event that the facility owner abandons the facility in a manner which poses a risk to surrounding populations, staff will coordinate with the California Office of Emergency Services, Santa Clara

County Environmental Health Department, and the California Department of Toxic Substances Control (DTSC) to ensure that any unacceptable risk to the public is eliminated. Funding for such emergency action can be provided by federal, state or local agencies until the cost can be recovered from the responsible party's (O.E.S. 1990).

RESPONSE TO PUBLIC AND AGENCY COMMENTS

DEPARTMENT OF PLANNING, CITY OF SAN JOSE

SJ-11

COMMENT: The City of San Jose requested more discussion "on the potential risks from the delivery and transportation of aqueous ammonia and other materials to the site" and on the "use, storage, and delivery of other hazardous materials identified in the AFC".

RESPONSE: The FSA includes a more thorough review and evaluation of the use, storage, and transportation of all hazardous materials listed in Table 8.12-3 of the AFC. The staff's method of assessment of the potential risks is also described. The use of natural gas and its transport through pipelines is discussed along with seismic safety issues. Six additional Conditions of Certification are proposed which would require the project owner to do the following:

- require that all vendors delivering any hazardous material to the site use only the route approved by the CPM.
- prepare and implement an Emergency Response Assistance Plan (ERAP) designed to render assistance to local authorities whenever any shipment of hazardous materials has a spill once the delivery vehicle leaves a major highway (US or Interstate).
- ensure that no combustible or flammable material is stored, used, or transported within 100 feet of the sulfuric acid tank.
- require that the natural gas pipeline be designed to meet CPUC General Order 112-D and 58 A standards, or any successor standards, be designed to withstand seismic stresses, and that five safety features be incorporated into the design and operation of the natural gas pipeline.
- ensure that the gas pipeline undergo a complete design review and detailed inspection every 30 years.
- require that after any significant seismic even in the area where surface rupture occurs within one mile of the pipeline, the gas pipeline be inspected.

SUZANNA WONG, PH.D/SANTA TERESA CITIZEN ACTION GROUP

SW-9

COMMENT: In relation to the aqueous ammonia to be stored on site, please provide the following information:

- a. The quantity to be stored on site;

- b. A description on the delivery, the method of storage, and the likely errors in the handling of the substance;
- c. An estimate and a 99.999999% confidence interval of the likelihood of a spill of aqueous ammonia in the lifetime of the power plant;
- d. An estimate and a 99.999999% confidence interval of the “accidental release” from aqueous ammonia stored on site.

RESPONSE: See Appendix C

- a. See project Impacts section of this testimony
- b. The likelihood of a spill is estimated on a yearly basis in the project impact section of this testimony. The life of the project is uncertain and was not used in the analysis, however, it may be calculated by assuming a project life and then multiplying that number of years, times the yearly risk. It is not possible to estimate a confidence on this type of analysis. However, staff does believe that the estimate provided has high confidence due to the conservative nature of assumptions used in its calculation.***
- c. See c. above.***

SW-10

COMMENT: In relation to the deliver, usage, and handling of natural gas, please provide the following information in scientific and laymen terms in relation to the risks involved:

- a. the diameter and the length of the pipeline in the transmission of natural gas;
- b. the pressure used in the transmission of natural gas;
- c. an estimate and a 99.999999% confidence interval for each of the following in the lifetime of the power plant; (I) the likelihood of a fire, (ii) the size of a fire that can occur, (3) the likelihood of an explosion, (4) the size of an explosion that can occur, (5) the likelihood of leakage;
- d. an estimate and a 99.999999% confidence interval of a fire and/or an explosion in the lifetime of the power plant.

RESPONSE: See response to SW-9 above.

SW-11

COMMENT: Please provide:

- a. information on how records on leakage, accidents, mishandling, fires, and explosions etc. are kept, and how records are verified;
- b. estimates of releases of hazardous materials through leakage, accidental releases, ventilation systems, fires, and explosions, together with the associated health risks;
- c. an estimate and a 99.999999% confidence interval for adverse public health risk in the lifetime of the power plant in the event of an earthquake of magnitude 2 through 8.

RESPONSE: Reporting, documentation and verification of accidental releases will be in accordance with applicable regulations. Staff would also investigate any major release that caused any significant risk to the public or workers.

a. See response to SW – 9 above.

b. See response to SW – 9 above.

CONCLUSIONS AND RECOMMENDATIONS

Staff's evaluation of the proposed project (with staff's proposed mitigation measures) indicates that hazardous materials use will pose no potential for significant impacts on the public. With adoption of the proposed conditions of certification, the proposed project will comply with all applicable laws, ordinances, regulations and standards (LORS). In response to Health and Safety Code, section 25531 et seq., the applicant will be required to develop an RMP. The RMP will be submitted to EPA, Santa Clara County, and staff for evaluation. To insure adequacy of the RMP, staff's proposed conditions of certification require that the RMP be submitted for concurrent review by EPA, Santa Clara County and staff. In addition, staff's proposed conditions of certification also require Santa Clara County's acceptance of the RMP and staff's approval of the RMP prior to delivery of any hazardous materials to the facility. With adoption of staff's proposed conditions of certification, the project will also comply with Health and Safety Code, section 41700, and it will not pose any potential for significant impacts to the public from hazardous materials releases.

Staff recommends the Energy Commission impose the proposed conditions of certification, presented herein, to ensure that the project is designed, constructed and operated to comply with applicable LORS and to protect the public from significant risk of exposure to an accidental ammonia release.

PROPOSED CONDITIONS OF CERTIFICATION

HAZ-1 The project owner shall not use any hazardous material in reportable quantities, as specified in Title 40, C. F.R. Part 355, Subpart J, section 355.50, not listed in Appendix C, below, or in greater quantities than those identified by chemical name in Appendix C, below, unless approved in advance by Santa Clara County and the CPM.

Verification: The project owner shall provide to the CPM, in the Annual Compliance Report, a list of hazardous materials contained at the facility in reportable quantities.

HAZ-2 The project owner shall provide a Risk Management Plan to Santa Clara County and the CPM for review at the time the plans are first submitted to the U.S. Environmental Protection Agency (EPA). The project owner shall include all recommendations of Santa Clara County and the CPM in the final document. A copy of the final plans, including all comments, shall be provided to Santa Clara County and the CPM once approved by EPA.

Verification: At least sixty (60) days prior to the delivery of aqueous ammonia the project owner shall provide the final plans listed above and accepted by Santa Clara County to the CPM for approval.

HAZ-3 The project owner shall develop and implement a safety management plan for delivery of ammonia. The plan shall include procedures, protective equipment requirements, training and a checklist.

Verification: At least sixty days prior to the delivery of aqueous ammonia to the MEC facility, the project owner shall provide a safety management plan as described above to the CPM for review and approval.

HAZ-4 The aqueous ammonia storage facility shall be designed to either the ASME Pressure Vessel Code and ANSI K61.6 or to API 620. In either case, the storage tank shall be protected by a secondary containment basin capable of holding 150% of the storage volume plus the volume associated with 24 hours of rain assuming the 25-year storm.

Verification: At least sixty days prior to delivery of aqueous ammonia to the MEC, the project owner shall submit final design drawings and specifications for the ammonia storage tank and secondary containment basin to the CPM for review and approval.

HAZ-5 The project owner shall provide a covered secondary containment basin to passively contain any spill during the delivery of aqueous ammonia to the storage facility.

Verification: At least sixty days prior to construction of the secondary containment basin described above, the project owner shall provide detailed design drawings and specifications for the secondary containment basin to the CPM for review and approval.

HAZ-6 The project owner shall require that the gas pipeline undergo a complete design review and detailed inspection every 30 years and each 5 years thereafter.

Verification: At least thirty days prior to the initial flow of gas in the pipeline, the project owner shall provide a detailed plan to accomplish a full and comprehensive pipeline design review in the future to the CMP for review and approval. This plan shall be amended, as appropriate, and submitted to the CPM for review and approval, not later than one year before the plan is implemented.

HAZ-7 After any significant seismic event in the area where surface rupture occurs within one mile of the pipeline, the gas pipeline shall be inspected by the project owner.

Verification: At least thirty days prior to the initial flow of gas in the pipeline, the project owner shall provide a detailed plan to accomplish a full and comprehensive pipeline inspection in the event of an earthquake to the CMP for review and

approval. This plan shall be amended, as appropriate, and submitted to the CPM for review and approval, at least every five years.

HAZ-8 The project owner shall direct all vendors delivering any hazardous material to the site to use only the route approved by the CPM.

Verification: At least sixty (60) days prior to receipt of any hazardous materials on site; the project owner shall submit copies of the required transportation route limitation to the CPM for review and approval.

HAZ-9 The natural gas pipeline shall be designed to meet CPUC General Order 112-D and 58 A standards, or any successor standards, and will be designed to meet Class III service. The pipeline will be designed to withstand seismic stresses and will be leak surveyed annually for leakage. The project owner shall incorporate the following safety features into the design and operation of the natural gas pipeline: (1) the pipeline will be designed and constructed to carry natural gas at a pressure of 400 psig, (2) butt welds will be x-rayed and the pipeline will be pressure tested prior to the introduction of natural gas into the line; (3) the pipeline will be surveyed for leakage annually according to the "Periodic Leak Surveys of Gas Transmission and Distribution Facilities" document provided by the applicant; (4) the pipeline will be marked to prevent rupture by heavy equipment excavating in the area; and (5) valves will be installed to isolate the line if a leak occurs.

Verification: Prior to the introduction of natural gas into the pipeline, the project owner shall submit design and operation specifications to the CPM for review and approval.

HAZ-10 The project owner shall ensure that no combustible or flammable material is stored, used, or transported within 100 feet of the sulfuric acid tank.

Verification: At least sixty (60) days prior to receipt of sulfuric acid on site, the Project Owner shall provide copies of the facility design drawings showing the location of the sulfuric acid storage tank and the location of any tanks, drums, or piping containing any combustible or flammable material and the route by which such materials will be transported through the facility.

HAZ-11 The project owner shall direct all vendors delivering aqueous ammonia to the site to use only transport vehicles which meet or exceed the specifications described in the data response dated July 19, 2000 from CH2MHill.

Verification: At least sixty (60) days prior to receipt of aqueous ammonia on site, the project owner shall submit copies of the notification letter to supply vendors indicating the transport vehicle specifications to the CPM for review and approval.

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APPENDIX A - HAZARDOUS MATERIAL MANAGEMENT

BASIS FOR STAFF'S USE OF 75 PPM AMMONIA EXPOSURE CRITERIA

Staff uses a criterion of 75 ppm to evaluate the significance of impacts associated with potential accidental releases of ammonia. While this criterion is not consistent with the 200 ppm criterion used by EPA and Cal EPA in evaluating such releases pursuant to the Federal Risk Management Program and State Accidental Release Program, it is appropriate for use in staff's CEQA analysis. The Federal Risk Management Program and the State Accidental Release Program are administrative programs designed to address emergency planning and ensure that appropriate safety management practices are implemented and actions are taken in response to accidental releases. However, the regulations implementing these programs do not provide clear authority to require design changes or other major changes to a proposed facility. The preface to the Emergency Response Planning Guidelines (ERPGs) states that "these values have been derived as planning and emergency response guidelines, **not** exposure guidelines, they do not contain the safety factors normally incorporated into exposure guidelines. Instead they are estimates, by the committee, of the thresholds above which there would be an unacceptable likelihood of observing the defined effects." It is staff's contention that these values apply to healthy adult individuals and are levels that should not be used to evaluate the acceptability of avoidable exposures. While these guidelines are useful in decision making in the event that a release has already occurred (for example, prioritizing evacuations), they are not appropriate for and are not binding on discretionary decisions involving proposed facilities where many options for mitigation are feasible. CEQA requires permitting agencies making discretionary decisions to identify and mitigate potentially significant impacts through changes to the proposed project.

Staff has chosen to use the National Research Council's 30 minute Short Term Public Emergency Limits (STPELs) to determine the potential for significant impact. These limits are designed to apply to accidental unanticipated releases and subsequent public exposure. Exposure at these levels should not result in "serious sequelae" but would result in "strong odor, lacrimation, and irritation of the upper respiratory tract (nose and throat), but no incapacitation or prevention of self-rescue." It is staff's opinion that exposures of the general public to concentrations above these levels pose significant risk of adverse health impacts on sensitive members of the general public. It is also staff's position that these exposure limits are the best available criteria to use in gauging the significance of public exposures associated with potential accidental releases. It is, further, staff's opinion that these limits constitute an appropriate balance between public protection and mitigation of unlikely events, and are useful in focusing mitigation efforts on those release scenarios that pose real potential for serious impacts on the public. Table 1 provides a comparison of the intended use and limitations associated with each of the various criteria that staff considered in arriving at the decision to use the 75-ppm STPEL.

HAZARDOUS MATERIAL MANAGEMENT APPENDIX A TABLE 1

Acute Ammonia Exposure Guidelines

Guideline	Responsible Authority	Applicable Exposed Group	Allowable Exposure Level	Allowable* Duration of Exposures	Potential Toxicity at Guideline Level/Intended Purpose of Guideline
IDLH ²	NIOSH	Workplace standard used to identify appropriate respiratory protection.	300 ppm	30 min.	Exposure above this level requires the use of "highly reliable" respiratory protection and poses the risk of death, serious irreversible injury or impairment of the ability to escape.
IDLH/10 ¹	EPA, NIOSH	Work place standard adjusted for general population factor of 10 for variation in sensitivity	30 ppm	30 min.	Protects nearly all segments of general population from irreversible effects
STEL ²	NIOSH	Adult healthy male workers	35 ppm	15 min. 4 times per 8 hr day	No toxicity, including avoidance of irritation
EEGL ³	NRC	Adult healthy workers, military personnel	100 ppm	Generally less than 60 min.	Significant irritation but no impact on personnel in performance of emergency work; no irreversible health effects in healthy adults. Emergency conditions one time exposure
STPEL ⁴	NRC	Most members of general population	50 ppm 75 ppm 100 ppm	60 min. 30 min. 10 min.	Significant irritation but protects nearly all segments of general population from irreversible acute or late effects. One time accidental exposure
TWA ²	NIOSH	Adult healthy male workers	25 ppm	8 hr.	No toxicity or irritation on continuous exposure for repeated 8 hr. work shifts
ERPG-2 ⁵	AIHA	Applicable only to emergency response planning for the general population (evacuation) (not intended as exposure criteria) (see preface attached)	200 ppm	60 min.	Exposures above this level entail** unacceptable risk of irreversible effects in healthy adult members of the general population (no safety margin)

1) (EPA 1987) 2) (NIOSH 1994) 3) (NRC 1985) 4) (NRC 1972) 5) (AIHA 1989)

* The (NRC 1979), (WHO 1986), and (Henderson and Haggard 1943) all conclude that available data confirm the direct relationship to increases in effect with both increased exposure and increased exposure duration.

**** THE (NRC 1979) DESCRIBES A STUDY INVOLVING YOUNG ANIMALS WHICH SUGGESTS GREATER SENSITIVITY TO ACUTE EXPOSURE IN YOUNG ANIMALS. THE (WHO 1986) WARNS THAT THE YOUNG, ELDERLY, ASTHMATICS, THOSE WITH BRONCHITIS AND THOSE THAT EXERCISE SHOULD ALSO BE CONSIDERED AT INCREASED RISK BASED ON THEIR DEMONSTRATED GREATER SUSCEPTIBILITY TO OTHER NON-SPECIFIC IRRITANTS.**

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ABBREVIATIONS

ACGIH, American Conference of Governmental and Industrial Hygienists
AIHA, American Industrial Hygienists Association
EEGL, Emergency Exposure Guidance Level
EPA, Environmental Protection Agency
ERPG, Emergency Response Planning Guidelines
IDLH, Immediately Dangerous to Life and Health Level
NIOSH, National Institute of Occupational Safety and Health
NRC, National Research Council
STEL, Short Term Exposure Limit
STPEL, Short Term Public Emergency Limit
TLV, Threshold Limit Value
WHO, World Health Organization

APPENDIX B

SUMMARY OF ADVERSE HEALTH EFFECTS OF AMMONIA

638 PPM

WITHIN SECONDS:

- significant adverse health effects;
- might interfere with capability to self rescue;
- reversible effects such as severe eye, nose and throat irritation.

AFTER 30 MINUTES:

- persistent nose and throat irritation even after exposure stopped;
- irreversible or long-lasting effects possible: lung injury;
- sensitive people such as the elderly, infants, and those with breathing problems (asthma) experience difficulty in breathing;
- asthmatics will experience a worsening of their condition and a decrease in breathing ability which might impair their ability to move out of area.

266 PPM

WITHIN SECONDS:

- adverse health effects;
- very strong odor of ammonia;
- reversible moderate eye, nose and throat irritation.

AFTER 30 MINUTES:

- some decrease in breathing ability but doubtful that any effect would persist after exposure stopped;
- sensitive persons: experience difficulty in breathing;
- asthmatics: may have a worsening condition and decreased breathing ability which might impair their ability to move out of the area.

64 PPM

WITHIN SECONDS:

- most people would notice a strong odor;
- tearing of the eyes would occur;
- odor would be very noticeable and uncomfortable.

- sensitive people could experience more irritation but it would be unlikely that breathing would be impaired to the point of interfering with capability of self rescue
- mild eye, nose, or throat irritation
- eye, ear, & throat irritation in sensitive people
- asthmatics might have breathing difficulties but would not impair capability of self rescue

22 OR 27 PPM

WITHIN SECONDS:

- most people would notice an odor;
- no tearing of the eyes would occur;
- odor might be uncomfortable for some;
- sensitive people may experience some irritation but ability to leave area would not be impaired;
- slight irritation after 10 minutes in some people.

4.0, 2.2, OR 1.6 PPM

- No adverse effects would be expected to occur;
- doubtful that anyone would notice any ammonia (odor threshold 5 - 20 ppm);
- some people might experience irritation after 1 hr.

APPENDIX C – LIST OF HAZARDOUS MATERIALS

[Attach AFC Table 8.12-3]

WASTE MANAGEMENT

Testimony of Michael Ringer

INTRODUCTION

This analysis presents an assessment of issues associated with managing wastes generated from constructing and operating the Metcalf Energy Center (MEC) project. It evaluates the proposed waste management plans and mitigation measures designed to reduce the risks and environmental impacts associated with handling, storing, and disposing of project-related hazardous and nonhazardous wastes. The technical scope of this analysis encompasses wastes generated during facility construction and operation, except wastewaters discharged to municipal treatment facilities. These are discussed in the **Soil and Water Resources** section of this document.

Energy Commission staff's objectives in its waste management analysis are to ensure that:

- The management of wastes will be in compliance with all applicable laws, ordinances, regulations, and standards (LORS). Compliance with LORS ensures that wastes generated during constructing and operating the proposed project will be managed in an environmentally safe manner; and
- Disposal of project wastes will not result in significant adverse impacts to existing waste disposal facilities.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

FEDERAL

RESOURCE CONSERVATION AND RECOVERY ACT (42 U.S.C. § 6922)

RCRA establishes requirements for the management of hazardous wastes from the time of generation to the point of ultimate treatment or disposal. Section 6922 requires generators of hazardous waste to comply with requirements regarding:

- Record keeping practices which identify quantities of hazardous wastes generated and their disposition,
- Labeling practices and use of appropriate containers,
- Use of a manifest system for transportation, and
- Submission of periodic reports to the EPA or authorized state.

TITLE 40, CODE OF FEDERAL REGULATIONS, PART 260

These sections contain regulations promulgated by the EPA to implement the requirements of RCRA as described above. Characteristics of hazardous waste are described in terms of ignitability, corrosivity, reactivity, and toxicity, and specific types of wastes are listed.

STATE

CALIFORNIA HEALTH AND SAFETY CODE §25100 ET SEQ. (HAZARDOUS WASTE CONTROL ACT OF 1972, AS AMENDED).

This act creates the framework under which hazardous wastes must be managed in California. It mandates the State Department of Health Services (now the Department of Toxic Substances Control under the California Environmental Protection Agency, or Cal EPA) to develop and publish a list of hazardous and extremely hazardous wastes, and to develop and adopt criteria and guidelines for the identification of such wastes. It also requires hazardous waste generators to file notification statements with Cal EPA and creates a manifest system to be used when transporting such wastes.

TITLE 14, CALIFORNIA CODE OF REGULATIONS, §17200 ET SEQ. (MINIMUM STANDARDS FOR SOLID WASTE HANDLING AND DISPOSAL)

These regulations set forth minimum standards for solid waste handling and disposal, guidelines to ensure conformance of solid waste facilities with county solid waste management plans, as well as enforcement and administration provisions.

TITLE 22, CALIFORNIA CODE OF REGULATIONS, §66262.10 ET SEQ. (GENERATOR STANDARDS)

These sections establish requirements for generators of hazardous waste. Under these sections, waste generators must determine if their wastes are hazardous according to either specified characteristics or lists of wastes. As in the federal program, hazardous waste generators must obtain EPA identification numbers, prepare manifests before transporting the waste off site, and use only permitted treatment, storage, and disposal facilities. Additionally, hazardous waste must only be handled by registered hazardous waste transporters. Generator requirements for record keeping, reporting, packaging, and labeling are also established.

LOCAL

There are no local LORS for waste management.

SETTING

PROJECT AND SITE DESCRIPTION

The MEC project consists of a 600 megawatt natural gas-fired combined cycle power plant, a one mile natural gas pipeline, 10.2 mile recycled water supply lines, and a 0.8 mile municipal water supply and industrial wastewater discharge lines.

The project is proposed to be constructed on a site 136 acres in size, partly within the County of Santa Clara and partly within the city of San Jose. In 1998, Calpine Corporation commissioned a Phase I Environmental Site Assessment (ESA) for the site by Environmental Resources Management (ERM) in accordance with American Society for Testing and Materials Standard E 1527-97, Standard Practice for

Environmental Site Assessments (ERM 1999). The purpose of an ESA is to determine the potential for the presence or likely presence of any hazardous substances or petroleum products under conditions that may indicate a release or threat of a release from present or past activities.

The land at the proposed site has never been developed, although a portion was used for agriculture until about 1970. Over the past decade, mixed construction and wastes have been brought to the site and stored or dumped there. In addition, vehicle storage and, probably, maintenance have occurred there.

In November, 1998, ERM conducted a site inspection and identified the following:

- aboveground storage tanks were seen, although ERM was unable to verify if they were empty or full;
- evidence of hydraulic oil leaking into the soil from heavy equipment;
- discolored soil in and around open landfill areas;
- cans and drums with unknown contents; and
- possible existence of asbestos-containing material in piles of roofing or building debris.

ERM also conducted a database search of publicly available information to help determine the environmental status of the proposed site, and whether it may have been affected by possible off-site contamination. The search included federal and state agency records listing sites with leaking underground tanks, landfills, releases of hazardous materials, contaminated wells, sites where hazardous waste is handled, and facilities which release toxic chemicals to the air, water, or land. The search radius around the site ranged from 0.625 to 1.5 miles. ERM evaluated identified sites to determine their potential to have an adverse impact on the MEC site. Criteria used to evaluate sites included distance from the proposed MEC site, expected depth and direction of ground water and surface water flow, likely storm water flow direction, and the presence or absence of documented contaminant releases at the identified sites. ERM reported the following findings:

- The Pacific Gas and Electric substation about 0.4 mile north of the proposed site was the site of a petroleum hydrocarbon release from a 150 gallon underground storage tank (UST) closure in 1987. The case was closed by the Santa Clara Valley Water District (SCVWD) in 1993. Due to the distance and direction from the subject site, as well as the volume and level of soil contamination, ERM does not expect that the release poses any environmental concerns to the proposed site.
- In 1990, low levels of soil contamination were found about 0.6 mile northwest of the proposed site, at the location of a former gasoline station from which USTs had been removed in the late 1970s. The case was closed by the SCVWD in 1991, and should not affect the MEC site.

- Two diesel and two gasoline USTs were removed in 1994 from the Universal Gas location about 0.6 mile southeast of the MEC site. In 1998, the site was placed in the local oversight program due to the levels of soil contamination from total petroleum hydrocarbons. SCVWD has requested sampling to determine the full extent of residual soil contamination and any groundwater contamination. ERM concluded that, in spite of the distance to the MEC site, the potential for environmental effects upon that site cannot be stated until groundwater contamination and flow are known.
- A 5000 gallon diesel spill occurred in 1993, about 0.1 mile north of the proposed site across Monterey Road. Although no information is available regarding contamination levels, ERM concluded it unlikely that the release would affect the MEC site, since it is hydrologically downgradient, and any contamination would be transported further away from the site.

Based on the results of the Phase I ESA, ERM made recommendations for sampling to assess potential impacts in shallow soils, debris, and groundwater. In June 1999, ERM performed a Phase II ESA to provide data to evaluate the scope of potential remedial activities for soil and groundwater and the need for removal of hazardous materials from the site (Calpine/Bechtel 1999j, data response #113). Based on soil sampling at eleven locations, water sampling at four locations, and sampling of construction debris, ERM concluded:

- No evidence of soil contamination with petroleum fuels, lubricants, volatile fuel components, solvents, or semi-volatile constituents;
- Trace concentrations of pesticides at one location are likely the result of former agricultural activities;
- Elevated chromium and nickel concentrations at two locations, although likely higher than statistical background levels, appear to be isolated and do not seem to be related to any releases at the site;
- No evidence of groundwater contamination with the organic and inorganic constituents evaluated;
- About 40 cubic yards of asbestos contaminated soil and debris at the site will require removal; and
- No evidence of any other regulated wastes in the stockpile of debris.

Pursuant to a Memorandum of Understanding between the Commission and the Department of Toxic Substances Control (DTSC), DTSC provided comments to staff on the Application, including the Phase I and II ESAs (DTSC 2000). DTSC determined that further investigation is required to adequately characterize the site. While acknowledging the sampling performed for the Phase II ESA, DTSC noted that although uncovered asbestos was found in stockpiles, surface soil samples were not collected. Further, the unlabeled drums and the area immediately surrounding them were not sampled, and it was unclear whether the stained surface soil near the open landfill areas was sampled. Also, it did not appear that any attempt was made to sample in the areas previously identified as inaccessible.

DTSC also recommended that the above ground storage tanks be examined to determine their integrity and whether they contain any material.

Additional site characterization activities were conducted and reported in an Interim Final Phase II ESA which was submitted to the Commission on May 25, 2000 (Calpine/Bechtel 2000d, Attachment WM-241). Additional soil sampling was conducted in the vicinity of the aboveground storage tank and in the vehicle yard. Also, certification was provided that stockpiles containing asbestos materials had been removed, and there were no other asbestos containing materials remaining. Results of the additional sampling activities did not indicate any conditions of concern. Limited further soil and/or groundwater investigations were recommended to fully characterize previously inaccessible areas of the site. Staff will propose a condition of certification requiring such investigations prior to facility construction.

In addition to the ESAs performed for the proposed site, a database search was performed for potentially contaminated sites which may be encountered during construction of the linear facilities (Calpine/Bechtel 1999r, data response # 210). The search was for known hazardous substance release sites and operating underground storage tanks up to one-half mile of either side of the proposed and alternative linear facility routes. Table WM210-1 (Id.) lists 28 leaking underground storage tanks within 250 feet of either side of the linear facilities. Of the 28 sites, 23 occur right on or directly adjacent to the proposed and alternative linear facilities. However, many of the sites are considered "closed" by the Santa Clara Valley Water District (SCVWD) and require "no further action", meaning that the site has been cleaned, or no cleanup activities were deemed necessary. Twelve of the sites are still under oversight by the SCVWD for potential groundwater contamination (Calpine/Bechtel 1999r, data response # 210, Table WM210-2 and Figures WM210-1A,1B). Contaminated soil or groundwater is likely to exist at the listed sites, but the extent of contamination is not indicated.

In addition to the reported leaking underground storage tanks, there are 24 sites within 250 feet of the linear routes that have a total of 79 active operating underground storage tanks (Calpine/Bechtel 1999r, data response # 210, Table WM210-3).

DTSC staff recommended that samples be collected along the linear facility routes to characterize the soils to determine potential health risks to workers and soil management plans (DTSC 2000). However, discussions with DTSC staff indicated that their concerns regarding worker safety and soil management would be satisfied with the implementation of appropriate health and safety precautions during construction. Additionally, DTSC's Waste Evaluation Unit has provided guidance to PG&E regarding the regulatory status of soils excavated during installation of underground equipment (Calpine/Bechtel 2000e, Attachment WM-1). DTSC's guidance included the following: "If, during the course of the installation,...soil which has been excavated is determined to be contaminated, PG&E will implement appropriate health and safety precautions to protect its employees and the public and prevent or minimize any exposure to potentially harmful hazardous substances." Thus, possible contamination of soil is determined during the course of installation, and appropriate measures are then taken. Staff's proposed

Condition of Certification WASTE-4 in conjunction with an approved Health and Safety Plan (see the **Worker Safety and Fire Protection** section of this document) will ensure that contaminated soil discovered during excavation will be properly handled with appropriate worker and environmental protection.

IMPACTS

PROJECT SPECIFIC IMPACTS

CONSTRUCTION

Project site preparation and construction will generate both nonhazardous and hazardous wastes.

The proposed site currently contains wrecked automobiles, lumber, makeshift buildings, and assorted trash and debris. The nonhazardous waste will be removed by a waste removal company. The recyclable portion of the waste will be recovered with the remaining waste transferred to a Class III landfill (Calpine/Bechtel 1999a, AFC p. 8.13-2).

A variety of nonhazardous waste streams will be generated from construction of the generating plant, electric transmission line, natural gas supply line, and water supply and wastewater discharge lines. Paper, wood, glass, and plastics will be generated from packing materials, waste lumber, insulation, and empty chemical containers. The applicant estimates that about 100 tons of these wastes will be generated (Calpine/Bechtel 1999a, AFC p. 8.13-3), and those which cannot be recycled will be disposed of weekly in a Class III landfill. The applicant also expects that about 70 tons of excess concrete will be generated during the course of construction (Id.). This will be disposed of weekly in a Class III landfill or at clean fill sites. In addition, metal wastes will be generated from welding/cutting operations, packing materials, empty chemical containers, and wiring. About 25 tons of metal wastes are expected, and that which cannot be recycled will be deposited in a Class III landfill (Id.). Drilling will be necessary for some sections of the natural gas and water pipelines, and will require the use of nontoxic drilling mud. About 1300 barrels will be used, and will be disposed at a Class II or III landfill (Id.).

Hazardous wastes that may be generated during construction include waste oil and grease, paint, spent solvent, welding materials, and cleanup materials from spills of hazardous substances. The construction contractor is considered the actual waste generator and will be responsible for proper hazardous waste handling. Such wastes will be collected in hazardous waste accumulation containers near the point of generation. The containers will be taken to the construction contractor's hazardous waste storage area and within 90 days will be delivered to an authorized hazardous waste management facility (Calpine/Bechtel 1999a, AFC p. 8.13-4).

Initial pre-operational cleaning of internal surfaces of the heat recovery steam generators and auxiliary boiler will also generate chemical waste cleaning solutions and filters. These wastes will be stored temporarily onsite in portable tanks, and will

be disposed of offsite by a chemical cleaning contractor in accordance with applicable regulatory requirements (Calpine/Bechtel 1999a, AFC p. 2-13).

Hazardous wastes may also be generated if contaminated soils are encountered during site preparation or linear facility construction. When construction or excavation is planned in areas near known contaminated sites, MEC has committed to the following procedures to assure proper management of soil suspected to be contaminated (MEC 1999b, p. 93):

- Hand-held detection equipment, such as photoionization detectors, will be used in the field during excavation to ascertain the presence of volatile hazardous substances in excavated soil.
- Health and safety precautions will be implemented to prevent or minimize exposure to workers and the public if contaminated soil is determined to be present.
- Soil samples will be taken by trained personnel to confirm the nature of contamination.
- Soil suspected to be contaminated will be stockpiled near the site of excavation on polyethylene sheeting and covered while awaiting laboratory confirmation.
- Contaminated soil will be transported to an appropriately permitted facility.
- Only clean soil will be deposited back into the original excavation site.

In areas where there is no known or suspected contamination, soil which is discolored or has a petroleum hydrocarbon odor will be safely stockpiled until the nature of the contamination is determined by laboratory analysis (Id.). If the soil is found to be contaminated, procedures similar to those listed above will be followed.

OPERATION

Under normal operating conditions, the proposed facility will generate both nonhazardous and hazardous wastes.

Nonhazardous wastes generated during plant operation include trash, office wastes, empty containers, broken or used parts, used packing material, and used filters. The quantities of nonhazardous wastes generated from gas-fired facilities such as the MEC project are typically minor. MEC estimates that about 70 cubic yards annually of such wastes will be generated (Calpine/Bechtel 1999a, AFC p. 8.13-4).

During routine project operation, hazardous wastes likely to be generated include cleaning solutions, spent air pollution control catalysts, used oil and filters, used cleaning solvents, cooling tower sludge, and contaminated cleanup materials. AFC Table 8.13-1 summarizes the hazardous wastes expected to be generated at the MEC facility, their origin, quantity, and disposal method. The majority of hazardous wastes generated will be recycled. Cooling tower sludge, which consists of suspended solids that accumulate as sediment in the tower basin, may or may not be classified as hazardous, depending on operating conditions of the plant. Sediment accumulates at the rate of 100-200 pounds annually, and is removed every few years. Prior to removal, the material will be tested to determine if it must be managed as hazardous.

Hazardous wastes will be stored on site up to 90 days prior to their transport to a permitted facility by a licensed hauler. MEC has proposed that the storage area be surrounded by a berm sized to hold the contents of the single largest container plus an additional 20 percent to allow for rainfall (Calpine/Bechtel 1999a, AFC p. 8.13-11). The proposed design will have to meet the requirements of Title 22, California Code of Regulations, section 66264.175 which, in part, states that the containment system shall have sufficient capacity to contain precipitation from at least a 24-hour, 25-year storm plus 10 percent of the aggregate volume of all containers, or the volume of the largest container, whichever is greater. The Hazardous Material Compliance Division of Santa Clara County reviews hazardous waste containment plans when issuing their required Hazardous Material Clearance Form. Staff will propose that the project owner obtain such a form under condition of certification WASTE-5.

Chemical feed area drains consisting of spillage, tank overflows, effluent from maintenance operations, and liquid from area washdowns will be routed to a neutralization facility for pH adjustment. Elementary neutralization is a type of hazardous waste treatment under California regulations (Cal. Code Regs., tit. 22, § 67450.1 et seq.) and requires a permit from the Department of Toxic Substances Control.

IMPACT ON EXISTING WASTE DISPOSAL FACILITIES

Nonhazardous waste which is not recycled will be disposed of at one of the regional Class III landfills in the area. AFC Table 8.13-2 lists landfills and recycling facilities in the vicinity of the MEC project which accept nonhazardous wastes. Each of the facilities listed have large operating and permitted capacities relative to the quantities of waste expected from MEC. Even discounting the effects of recycling on the total amount of non-hazardous wastes destined for landfilling, the amount of waste generated during project construction and operation are insignificant relative to existing disposal capacity.

Three Class I landfills in California, at Kettleman Hills in King's County, Buttonwillow in Kern County, and Westmoreland in Imperial County, are permitted to accept hazardous waste. There is a combined total in excess of twenty million cubic yards of remaining hazardous waste disposal capacity at these facilities with remaining lifetimes as long as 50 years. Also, the amount of hazardous waste being transported to these landfills has decreased in recent years due to source reduction efforts by generators, and the transport of waste out of state that is hazardous under California law, but not federal law.

Much of the hazardous waste generated during facility construction and operation will be recycled, such as used oil and spent catalysts. Even without recycling, the generation of hazardous waste from MEC would comprise only a small fraction of existing capacity (less than one percent), and not significantly impact the capacity of any of the state's Class I landfills.

CUMULATIVE IMPACTS

Due to the minor amounts of wastes generated during project construction and operation, the insignificant impacts on individual disposal facilities, and the availability of additional regional landfills, cumulative impacts will be insignificant for both hazardous and nonhazardous wastes.

COMPLIANCE WITH APPLICABLE LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

Energy Commission staff concludes that MEC will be able to comply with all applicable LORS regulating the management of hazardous and non-hazardous wastes during project construction and operation. The applicant is required to dispose of hazardous and non-hazardous wastes at facilities approved by the San Francisco Bay Regional Water Quality Control Board or the CAL EPA - Department of Toxic Substances Control. Because hazardous wastes will be produced during project construction and operation, MEC must acquire and maintain an EPA identification number as a hazardous waste generator. Accordingly, MEC will be required to properly store, package and label waste, use only approved transporters, prepare hazardous waste manifests, and keep detailed records. Pursuant to California Code of Regulations, title 22, section 67100.1 et seq., a hazardous waste source reduction and management review may be required, depending on the amounts of hazardous waste ultimately generated.

MITIGATION

The Applicant intends to implement the following mitigation measures during construction and operation of the proposed MEC project (Calpine/Bechtel 1999a, AFC p. 8.13-11):

- Employees will be trained in hazardous waste procedures, spill contingencies, and waste minimization.
- Procedures will be developed to reduce the quantity of hazardous wastes generated. Nonhazardous materials will be used instead of hazardous materials whenever possible, and wastes will be recycled whenever possible.

Energy Commission staff has examined the mitigation measures proposed by MEC and concluded that the measures together with applicable LORS will adequately assure that no significant environmental impacts will result from the management and disposal of project-related waste.

FACILITY CLOSURE

During any type of facility closure (see staff's **General Conditions** section which discusses planned, unexpected temporary, and unexpected permanent closure), the primary waste management related concern is that project wastes not pose any potentially significant problem to the public, workers, or the environment. Staff has

determined that conditions of certification in the **General Conditions** section will adequately address waste management issues related to closure.

In the case of unexpected temporary closure, waste management practices normally required by LORS and already in-place (such as limiting hazardous waste accumulation time to 90 days and requiring proper containment) would likely be adequate to avoid significant problems. In addition, staff's General Conditions for Facility Closure require preparation of an on-site contingency plan which shall provide for removal of hazardous wastes and draining of all chemicals from storage tanks and other equipment for temporary closures exceeding 90 days.

An approved on-site contingency plan is also required to protect public health and safety in the case of unexpected permanent closure. As above, the plan must provide for the removal of hazardous materials and hazardous wastes, draining of all chemicals from storage tanks and other equipment, and the safe shutdown of all equipment.

For planned permanent closure, MEC is required to develop a facility closure plan at least twelve months prior to commencement of closure and is committed to complying with LORS which are applicable at the time of closure (Calpine/Bechtel 1999a, AFC p. 4-2).

CONCLUSIONS AND RECOMMENDATIONS

Management of the wastes generated during construction and operation of the MEC project will not result in any significant adverse impacts if MEC implements the mitigation measures proposed in the Application for Certification (99-AFC-3), the additional measure proposed by staff below, and the proposed conditions of certification.

Staff agrees with the procedures proposed by MEC regarding proper management of soil suspected to be contaminated (Calpine/Bechtel 1999h, p. 93), including use of hand-held detection equipment during excavation to ascertain the presence of volatile hazardous substances, implementing health and safety precautions to prevent or minimize exposure to workers and the public from contaminated soil, confirming the nature of contamination through sampling, stockpiling and covering contaminated soil near the site of excavation while awaiting laboratory confirmation, transporting contaminated soil to a permitted facility, and using only clean soil for backfill.

Staff further recommends that, during excavation activities, MEC have an environmental professional available to determine the need for sampling when contamination is suspected, and to coordinate the above activities as necessary. If significant remediation may be required, MEC should also contact representatives of the Santa Clara County Department of Environmental Health and the Berkeley Field Office of the California Department of Toxic Substances Control for consultation and possible oversight of remedial activities.

CONDITIONS OF CERTIFICATION

WASTE-1 The project owner shall obtain a hazardous waste generator identification number from the Department of Toxic Substances Control prior to generating any hazardous waste.

Verification: The project owner shall keep its copy of the identification number on file at the project site and notify the CPM via the monthly compliance report of its receipt.

WASTE-2 The project owner shall notify the CPM of any waste management-related enforcement action taken or proposed to be taken against it, or against any waste hauler or disposal facility or treatment operator that the owner contracts with.

Verification: The project owner shall notify the CPM in writing within 10 days of becoming aware of an impending enforcement action.

WASTE-3 Prior to the start of both construction and operation, the project owner shall prepare and submit to the CPM, for review and comment, a waste management plan for all wastes generated during construction and operation of the facility, respectively. The plans shall contain, at a minimum, the following:

- A description of all waste streams, including projections of frequency, amounts generated and hazard classifications; and
- Methods of managing each waste, including treatment methods and companies contracted with for treatment services, waste testing methods to assure correct classification, methods of transportation, disposal requirements and sites, and recycling and waste minimization/reduction plans.

Verification: No less than 60 days prior to the start of construction, the project owner shall submit the construction waste management plan to the CPM for review. The operation waste management plan shall be submitted no less than 60 days prior to the start of project operation. The project owner shall submit any required revisions within 30 days of notification by the CPM (or mutually agreed upon date). In the Annual Compliance Reports, the project owner shall document the actual waste management methods used during the year compared to planned management methods.

WASTE-4 The project owner shall have an environmental professional available for consultation during soil excavation and grading activities. The environmental professional shall be given full authority to oversee any earth moving activities that have the potential to disturb contaminated soil. The environmental professional shall meet the qualifications of such as defined by the American Society for Testing and Materials designation E 1527-97 Standard Practice for Phase I Environmental Site Assessments as evidenced by one of the following or similar credentials: (1) Certified Industrial Hygienist

with experience in worker exposure monitoring, (2) Qualified Environmental Professional certification, (3) Registered Environmental Assessor II, or (4) Registered Professional Engineer with experience in remedial investigation and feasibility studies.

Verification: At least 30 days prior to the start of construction, the project owner shall submit the qualifications and experience of the environmental professional to the CPM for approval.

WASTE-5 If potentially contaminated soil is unearthed during excavation at either the proposed site or linear facilities as evidenced by discoloration, odor, detection by handheld instruments, or other signs, the environmental professional shall inspect the site, determine the need for sampling to confirm the nature and extent of contamination, and file a written report to the project owner and CPM stating the recommended course of action. Depending on the nature and extent of contamination, the environmental professional shall have the authority to temporarily suspend construction activity at that location for the protection of workers or the public. If, in the opinion of the environmental professional, significant remediation may be required, the project owner shall contact representatives of the Santa Clara County Department of Environmental Health and Region 2 of the California Department of Toxic Substances Control for guidance and possible oversight.

Verification: The project owner shall notify the CPM in writing within 5 days of any reports filed by the environmental professional, and indicate if any substantive issues have been raised.

WASTE-6 The project owner shall obtain a Hazardous Material Clearance Form from the Santa Clara County Hazardous Materials Compliance Division.

Verification: Prior to the start of construction, the project owner shall provide an approved copy of the Santa Clara County Hazardous Materials Compliance Division's Hazardous Material Clearance Form to the CPM.

WASTE-7 The project owner shall perform additional limited investigations to fully characterize the site, including sampling soil in the area of the former asbestos containing material (ACM) piles to confirm that ACM is no longer present, sampling of the contents of the unlabeled drums and above ground storage tanks, and sampling of areas previously identified as inaccessible in the Phase II ESA.

Verification: Prior to the start of construction, the project owner shall submit analytical results of the additional sampling to the CPM as a ESA Addendum.

WASTE-8 All site debris, including stockpiles, drums, automotive debris, storage sheds, and living quarters, shall be removed from the site as soon as possible after the project owner has control of the site.

Verification: The project owner shall notify the CPM in writing within ten days of removal of site debris.

REFERENCES

- Calpine/Bechtel. 1999a. Application for Certification, Metcalf Energy Center (99-AFC-3). Submitted to the California Energy Commission, April 30, 1999.
- Calpine/Bechtel. 1999h. Set 1a data responses to CEC data requests submitted to the California Energy Commission on August 23, 1999.
- Calpine/Bechtel. 1999j. Set 1c data responses to CEC data requests submitted to the California Energy Commission on September 23, 1999.
- Calpine/Bechtel. 1999r. Set 2c data responses submitted to the California Energy Commission on November 12, 1999.
- Calpine/Bechtel. 2000d. Set 5 data responses submitted to the California Energy Commission on May 25, 2000.
- Calpine/Bechtel. 2000e. Set 7 Comments of MEC PSA submitted to the California Energy Commission on June 30, 2000.
- DTSC. 2000. Letter from Barbara J. Cook, Chief, Northern California – Coastal Cleanup Operations Branch to Mike Ringer, CEC. March 21.
- ERM (Environmental Resources Management). 1999. Phase I Environmental Site Assessment, Metcalf Site, San Jose, CA, April 13.

LAND USE

Testimony of Eric Knight

INTRODUCTION

This land use analysis of the Metcalf Energy Center (MEC) focuses on two main issues: the project's consistency with local land use plans, ordinances and policies; and the project's compatibility with existing and planned land uses. In general, an electric generation project and its related facilities may be incompatible with existing and planned land uses if it creates unmitigated noise, dust, public health hazard or nuisance, traffic, or visual impacts or when it unduly restricts existing or planned future uses.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

Calpine/Bechtel has exercised its purchase option on Assessor's Parcel Number (APN) 708-29-003, which includes 116 acres on the southeast side of Tulare Hill (Lot 5) and 10 acres of flat area at the base of Tulare Hill on the southeast side of Fisher Creek (Lot 7). This 126-acre parcel is currently in unincorporated Santa Clara County but within the Sphere of Influence of the City of San Jose¹. The 10-acre flat area is within the Urban Service Area of the City of San Jose². The applicant also has an ownership interest in 10 acres of Lot 6 (APNs 708-23-002, 003). This area is within the San Jose City limits. On March 1, 1999, Calpine/Bechtel filed an Annexation application with the City of San Jose to annex the 10-acre flat area (Lot 7) at the base of Tulare Hill³. The Tulare Hill portion of the property would remain in the County and would not be developed. Lot 7 and the 10 acres from Lot 6 would be combined through the Tentative Map process to configure a 20-acre site for the proposed power plant. Please refer to **LAND USE Figure 1**.

Since the proposed power plant site currently is located partly within the City of San Jose and partly within unincorporated Santa Clara County, staff reviewed all the San Jose and Santa Clara County planning documents relevant to the project. In addition, portions of the project's electrical transmission line and natural gas supply pipeline traverse unincorporated areas of Santa Clara County. A discussion of the project's conformity with applicable goals, policies, standards, and regulations from each of these planning documents can be found in the subsection entitled Compliance with Laws, Ordinances, Regulations, and Standards.

¹ A city's Sphere of Influence delineates the expected future physical boundaries and service area of that city.

² An Urban Service Area (USA) is defined as all developed, undeveloped, or agricultural lands, either incorporated or unincorporated, within a city's Sphere of Influence, where services and facilities are generally available, and where urban development requiring such services should be located.

³ A special provision of the Cortese-Knox Local Government Reorganization Act of 1985 (Gov. Code § 56826) allows cities within Santa Clara County to approve their own annexations within the established urban service area, bypassing the approval of the Santa Clara County Local Agency Formation Committee (LAFCO). This procedure is referred to generally as "city-conducted" annexations.

CITY OF SAN JOSE

GENERAL PLAN

The San Jose 2020 General Plan contains each of the elements mandated by Government Code Section 65302 (land use, circulation, housing, conservation, open space, noise, and safety). The elements have been combined into “a consistent meaningful whole” and organized to meet the needs of public officials, developers, neighborhood organizations, and community members. The General Plan contains a statement of development policies and includes a Land Use Diagram and text, which set forth the objectives, principles, standards, and plans to guide development proposals. The General Plan states that it “must always be considered in its entirety, with no single policy, principle, standard, or plan read and considered in isolation. It is also necessary that the General Plan provides some flexibility and not be applied or interpreted in such a rigid manner as to impede attainment of its objectives” (SJ 1994a, pp. 2-3).

NORTH COYOTE VALLEY CAMPUS INDUSTRIAL AREA MASTER DEVELOPMENT PLAN

In 1983, the City of San Jose amended its General Plan to allow Campus Industrial uses in North Coyote Valley. The Campus Industrial category is intended to allow development with a unique “campus” design concept that takes advantage of the site’s natural features and incorporates substantial amounts of landscaped and natural open space. Adopted as policy by the San Jose City Council on May 28, 1985 (Resolution #58353), the Master Development Plan represents a “clear and unequivocal” statement of how San Jose’s adopted General Plan is to be implemented in North Coyote Valley. The City of San Jose’s general goals for development of North Coyote Valley are: “1) to provide much-needed, large, single-user sites where major companies can consolidate their operations and; 2) by doing so, ensure the region’s long-term economic health” (SJ 1985, p.1).

While the Master Development Plan is not an ordinance, many of its provisions are included in Planned Development zonings and have the force of law⁴ (SJ 1985). The Master Development Plan includes Private Improvement Guidelines, which are “the concepts all development must incorporate.” The plan also sets forth development standards “which must appear, as a minimum, as part of all Planned Development Zoning approvals and Environmental Performance Standards which all development must meet.”⁵ The Master Development Plan reads:

“Even the low intensity of development in the Campus Industrial areas of Coyote Valley will not preserve its rural character if the large setbacks, height restrictions and landscape concepts outlined in this section are not followed. The unusually

⁴ According to the Master Development Plan, all development in North Coyote Valley will occur through Planned Development Zoning. For an explanation of Planned Development Zoning, see the discussion on the City’s Zoning Ordinance.

⁵ Amendments to the Private Improvement Standards and General Development Standards were approved by the City Council on November 8, 1999. Staff has conducted its consistency analysis based on the amended guidelines and standards.

restrictive nature of these guidelines is deliberate. North Coyote Valley will attract and hold the major 'high technology' users it is intended to accommodate only if there is a clearly established standard of excellence and a commitment to meet that standard" (SJ 1985).

RIPARIAN CORRIDOR POLICY STUDY

The Riparian Corridor Policy Study was adopted by the San Jose City Council on May 17, 1994, and revised March 1999. The overall purpose of the study is to explore in detail issues related to General Plan policies that promote the preservation of riparian corridors (the areas along natural streams) and how these corridors should be treated for consistency with the General Plan. The study primarily addresses riparian corridors within San Jose's Urban Service Area. Fisher Creek, which traverses the MEC site on its west and north sides, is included in the study. Recognizing that potential conflicts exist among competing land uses along riparian corridors (e.g., land development, flood control protection, habitat preservation), the study attempts to achieve a balance among these potentially incompatible land use activities through the application of development guidelines. The study states that these development guidelines are intended for use within the context of the overall goals of the City.

ZONING ORDINANCE

There are two forms of zoning in San Jose: conventional zoning and Planned Development (PD) zonings. Conventional zoning districts contained in the City's Zoning Ordinance include a range of allowed land uses, development intensities and standards within the major land use categories such as residential, commercial and industrial (SJ 1994a). The General Plan has the following to say about the City's Planned Development zonings:

"Planned Development zoning provides the means to tailor such regulations as allowed uses, site intensities and development standards to a particular site. These development standards and other site design issues implement the design standards set forth in the General Plan and design guidelines adopted by the City Council. This Planned Development zoning process enables the City Council to consider the *unique characteristics of a development site and its surroundings* to better implement the objectives, goals and policies of the General Plan" (emphasis added; SJ 1994a).

Development in North Coyote Valley will occur through PD zoning (SJ 1985). The PD zone or district is an override district, which is always combined with a conventional zoning district. The portion of the MEC site in the City is zoned Agriculture (A). The portion of the site currently in the County is zoned Agriculture, 20-acre minimum (A-20ac). Calpine/Bechtel filed Planned Development and Prezoning⁶ applications on August 12, 1999 to rezone the MEC site to A (PD). Approval of a PD district involves City Council adoption of an ordinance that

⁶ Prezoning is usually done before annexation of unincorporated land to a city in order to facilitate its transition into the city boundaries. The advantage is that a city will have zoning in effect immediately upon annexation.

includes specific land use regulations, design parameters, and performance standards for the site and its use. Because there are no specific development standards for Public/Quasi-Public uses, City planning staff have stated that a determination of appropriate development standards for the MEC would be based on applicable City plans and policies, such as the North Coyote Valley Campus Industrial Area Master Development Plan (SJ 1999b).

The second phase of the City's PD zoning process is the issuance of a Planned Development (PD) Permit. The PD Permit is a combined site/architectural permit and conditional use permit that implements the approved PD zoning on the property (SJ 1994a). The conditional use permit aspect of the PD Permit would be subsumed into the Energy Commission's license, since issuance of a certificate by the Energy Commission is in lieu of any local permit for the use of the site (Pub. Resources Code § 25500). Thus, any conditions the City wishes to have imposed on the project need to be considered by the Energy Commission and included, as appropriate, in the Energy Commission's license to have any binding effect on the MEC. Nevertheless, under the City's zoning ordinance, until a PD Permit is issued, the uses allowed on the property and the development standards applicable to the site are those which are allowed by the base zoning district only (SJ 1997; §20.36.030 and §20.36.040). The City's current zoning on the MEC site is Agriculture, which permits primarily agricultural uses. Other uses are conditionally allowed, such as public utility facilities. However, a power plant is not among the uses listed. The Agricultural District development standards restrict building and structure heights to 35 feet (§20.20.140). Until City Council approval of the PD Permit, the PD Zoning necessary for development of the MEC could not be effectuated, and the Agricultural District land use regulations would still apply to the site. Calpine/Bechtel submitted a preliminary draft of their PD Permit application in September.

COUNTY OF SANTA CLARA

GENERAL PLAN

Policies in the Santa Clara County General Plan (1995-2010) seek to maintain the scenic character of the rural, unincorporated areas of the County and to promote conservation and productive use of their natural resources for agriculture, ranching, watershed, public recreation, and wildlife habitat. In regard to unincorporated lands within city urban service areas, the General Plan states that these areas should eventually be annexed to their surrounding cities. Even before annexation occurs, development proposals within these areas must conform to the uses allowed in the surrounding city's general plan (SCC 1994).

SETTING

POWER PLANT SITE AND VICINITY

The proposed power plant site is located in Coyote Valley, which lies between the southernmost part of urbanized San Jose and the northern edge of the City of

Morgan Hill. The power plant site is located at the northern end of Coyote Valley at the base of Tulare Hill. Monterey Road lies to the east of the site and Metcalf Road is to the north. The site is bordered by Fisher Creek to the north and west and the Union Pacific Railroad (UPRR) tracks to the east. Blanchard Road is to the south. The fenced area of the power plant (which excludes the Fisher Creek riparian setback area) would be 10.73 acres. The riparian area, landscaping, and the access road from Blanchard Road would occupy the remainder of the 20-acre site. A 10-acre area adjacent to and south of the site would be used as a temporary laydown/staging area during construction of the power plant.

The 10-acre flat area at the base of Tulare Hill (the portion of the site under the County's jurisdiction) is currently used for storage of old vehicles and construction debris and for raising poultry and some minor cattle grazing. No cultivation activities occur on this portion of site. The southern 10 acres of the site and the 10-acre construction laydown area are farmed for field crops. The entire MEC site is designated as Prime Farmland on the 1998 Important Farmland Map for Santa Clara County compiled by the California Department of Conservation (CDC 1999).

Existing land uses within a one-mile radius of the MEC site are shown on **LAND USE Figures 2 – 5**. These uses include agricultural land, the Coyote Creek Parkway, and commercial uses. Sensitive land uses include scattered residences, the closest of which is located about 1,150 feet southeast of the MEC site (Calpine/Bechtel 1999a, p. 8.5-4). The Santa Teresa neighborhood, which is the nearest residential community, is located on the northwest side of Tulare Hill a little more than 0.5 mile from the site. An elementary school is located about 1.4 miles southeast of the site (Calpine/Bechtel 1999a, p. 8.5-4). Major electrical transmission lines owned by Pacific Gas & Electric Company (PG&E) are located about 200 feet north of the site. These lines traverse Tulare Hill east to west and connect to the PG&E Metcalf Substation, which is located about 2,000 feet northeast of the site adjacent to U.S. 101.

City of San Jose and Santa Clara County General Plan designations within one mile of the MEC site are shown on **LAND USE Figures 6 and 7**. The MEC site is designated Campus Industrial on the San Jose General Plan Land Use Diagram. The Santa Clara County General Plan designation for the site is Urban Service Area.

LINEAR FACILITIES

ELECTRICAL TRANSMISSION LINE

The power plant would interconnect with an existing PG&E 230 kV transmission line, which passes near the northern boundary of the MEC site, via a new 230 kV transmission line approximately 240 feet in length. The interconnection would be made at an existing transmission tower on Tulare Hill. The proposed transmission line would traverse primarily undeveloped grazing land in unincorporated Santa Clara County. The transmission line route is designated Am (Agriculture – medium scale) on the County Land Use Plan and zoned A-20Ac. The same area is

designated Non-Urban Hillside on the City of San Jose Land Use Diagram. The City does not have a zoning designation for this area.

NATURAL GAS SUPPLY PIPELINE

Natural gas would be delivered to the MEC via approximately one mile of new 16-inch pipeline that will connect to an existing PG&E main pipeline (Line 300), which runs along the east side of U.S. 101. A gas metering station, which consists of an aboveground segment of pipe and associated valves, metering equipment, and support structures, would be located immediately adjacent to PG&E's Line 300 on vacant land that lies just east of Malech Road and south of the county road that intersects Malech Road. The gas metering station would be within a 35 feet by 80 feet fenced area and would lie 370 feet from the northbound outside lane of U.S. 101 (Calpine/Bechtel, 2000f). The proposed pipeline would be bored beneath U.S. 101. It would then follow along Coyote Ranch Road and an unnamed road west toward Monterey Road. To go under Coyote Creek, Monterey Road, and the UPRR tracks, the pipeline would be installed by horizontal directional drilling. From a point on the western side of the railroad tracks just north of Blanchard Road, the pipeline would then proceed north along the western side of the railroad right-of-way to the power plant site (Calpine/Bechtel 1999a, p. 6-1).

About one-third of the gas pipeline route is within the City of San Jose and the remainder is within unincorporated Santa Clara County. Existing land use along the proposed gas pipeline is primarily park, vacant, and agricultural land. The route traverses areas designated Other Public Open Lands (PL) and Regional Parks, Existing (P) on the County Land Use Plan and Campus Industrial on the San Jose Land Use Diagram. The route is primarily zoned agricultural.

WATER SUPPLY AND WASTEWATER PIPELINES

A new 10.2-mile long pipeline would be constructed to deliver cooling water to the MEC. The primary source of cooling water would be recycled water from the South Bay Water Recycling (SBWR) Program. As described in AFC Supplement A (Calpine/Bechtel 1999e), the recycled water pipeline would begin north of the power plant site and weave its way along paved city streets, traveling primarily through residential and commercial areas, until reaching Fisher Creek at Santa Teresa Boulevard. South of Fisher Creek the recycled water pipeline would turn northeast, travelling through land currently in agricultural use on its way to the MEC site. The pipeline segment from Santa Teresa Boulevard to the MEC site is labeled "Segment B-3" in Supplement A. The agricultural land traversed by Segment B-3 is planted in safflower, orchard trees, wheat, and row crop. The area traversed by Segment B-3 is designated Campus Industrial on the San Jose General Plan Land Use Diagram. A portion of Segment B-3 traverses land that would be developed as part of the proposed Coyote Valley Research Project. Existing land uses within 0.25 mile of the recycled water pipeline are shown on AFC Figures 3.2-1a – 3.2-1g.

Potable water would be supplied by the San Jose Municipal Water System (San Jose MUNI) via a new 24-inch, 1.25-mile long pipeline⁷. The potable water pipeline would begin at Well #23 near Bailey Avenue and travel north to the MEC site along the western side of the UPRR right-of-way through agricultural land currently farmed for field crops (Calpine/Bechtel 2000a, data response # 3-229). The area traversed by the pipeline route is designated Campus Industrial.

San Jose MUNI has potable water pipelines in Santa Teresa Boulevard. As described in AFC Supplement A, the MEC may tap into a supply pipeline in Santa Teresa Boulevard as an alternative to the 1.25-mile long pipeline from Well #23. The alternative 0.8-mile long potable water supply pipeline would follow the same route as Segment B-3 of the recycled water supply pipeline.

As described in AFC Supplement A, the MEC would discharge industrial wastewater and sewage into an existing sewer pipeline in Santa Teresa Boulevard. Industrial wastewater and sewage would be conveyed in a single pipeline, which would follow the same route as Segment B-3 of the recycled water supply pipeline.

Construction of the recycled water pipeline, alternate domestic water pipeline, and wastewater discharge pipeline along Segment B-3 would require a construction corridor with a maximum width of 66 feet (Calpine/Bechtel 1999e, page 2-3).

SITE ACCESS ROADS

As proposed in the AFC, the power plant site would be accessed from Blanchard Road off of Monterey Road. Access to the site would be across the UPRR tracks. A new 900-foot long, two-lane road would be constructed beginning at Blanchard Road and paralleling the UPRR tracks north to the MEC site. The new access road would be located on land that is currently being used for agriculture and designated Campus Industrial on the San Jose General Plan Land Use Diagram.

In its comments on the PSA (dated June 28, 2000), City staff raised concerns about the inadequacy of access to the MEC site, since the project's single point of access would be across a major railroad line. The City is concerned about the periodic inaccessibility of the MEC site during periods when trains are on or approaching the section of track adjacent to the project site. In response to the City's comments, the applicant proposes to construct a "western" access road that would serve as the primary access to the MEC site (Calpine/Bechtel, PSA Comments, Set 8). The 1,500-foot long, two-lane western access road would provide access to the MEC site from Santa Teresa Boulevard via a future road within the proposed Coyote Valley Research Park (CVRP). To connect the MEC site to the planned CVRP road network, the western access road would cross two privately owned lands currently used for agriculture. To the point of connection with the CVRP road network, the western access road would be located over the water pipeline corridor described as Segment B-3 in AFC Supplement A. If the CVRP project is approved, rather than

⁷ As an alternative to San Jose MUNI, potable water may be supplied by Great Oaks Water Company via an interconnection point that has not been defined. Great Oaks Water Company owns and operates a public water supply system just north of Coyote Valley in the Santa Teresa area (Calpine/Bechtel, Project Description, August 16, 2000).

continuing across land currently in agricultural use, the applicant expects they could construct the remaining portion of Segment B-3 underneath the public streets to be developed as part of the CVRP (Calpine/Bechtel, PSA Comments, Set 8). The western access road would be set back from Fisher Creek at a distance of at least 100 feet from the top of the bank. The construction and use of the western access road is dependent on the applicant's ability to obtain easements and access rights across privately held property, and the development of public streets within the CVRP project.

IMPACTS

Appendix G of the Guidelines to the California Environmental Quality Act (CEQA), indicate that the following criteria are relevant to determining whether a land use impact is a "significant effect":

- Would the project conflict with any applicable land use plan, policy, or regulation of an agency with jurisdiction over the project adopted for the purpose of avoiding or mitigating an environmental effect.
- Would the project disrupt or divide the physical arrangement of an established community.
- Would the project convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use.

In addition, staff evaluates whether a project would cause compatibility conflicts with existing and planned land uses. In general, a power plant and its related facilities may be incompatible with existing and planned land uses if it creates unmitigated noise, dust, public health hazard or nuisance, traffic, or visual impacts or if it unduly restricts existing or future uses.

CONSISTENCY WITH LAWS, ORDINANCES, REGULATIONS AND STANDARDS

Public Resources Code section 25525 states that the Energy Commission shall not certify any facility when it finds "that the facility does not conform with any applicable state, local, or regional standards, ordinances, or laws, unless the commission determines that such facility is required for public convenience and necessity and that there are not more prudent and feasible means of achieving such public convenience and necessity." When determining whether a project is in conformance with state, local or regional standards, ordinances, or laws, Energy Commission staff typically meets and consults with the applicable agencies to determine conformity. The laws, ordinances, regulations, standards (LORS) and policies applicable to the project have been analyzed below to determine the extent to which the project is consistent or at variance with each requirement or standard⁸.

⁸ A summary of the project's consistency with applicable laws, ordinances, regulations, and standards can be found in Appendix A of this analysis.

CITY OF SAN JOSE

GENERAL PLAN

Land Use Diagram

The 20-acre MEC site is designated Campus Industrial on the Land Use Diagram of the City of San Jose General Plan. According to the General Plan, land uses allowed in the Campus Industrial category are “industrial research and development, administration, marketing, assembly, and manufacturing.” City of San Jose Planning staff determined that a heavy industrial use such as a power plant would not be allowed by the Campus Industrial designation, but could be allowed by either the Heavy Industrial or Public/Quasi-Public designations. On the direction of City Planning staff, Calpine/Bechtel filed a General Plan amendment on March 1, 1999 to request the land use designation of the project site to be changed from Campus Industrial to Public/Quasi-Public⁹. In explaining the City staff’s decision on why Public/Quasi-Public would be more appropriate for the MEC site than Heavy Industrial, City staff wrote:

“Although the proposed power plant is a heavy industrial use, Planning staff has determined that the City will have more land use control in this area not planned for Heavy Industrial with the Public/Quasi-Public land use designation. This is important in the event the amendment is approved but the Metcalf Energy Center does not proceed. There is little likelihood that another public/quasi-public project would be proposed for the site before the City could change the General Plan designation back to Campus Industrial. A Heavy Industrial land use designation does not provide the same amount of control in that a wide range of uses would be allowed under that designation, such as manufacturing activities involving hazardous materials. Such a broad designation could lead to land use incompatibilities between the Heavy Industrial and Campus Industrial uses” (SJ 1999b).

According to the General Plan, the Heavy Industrial “category is intended for industrial uses with nuisance or hazardous characteristics which for reasons of health, safety, environmental effects, or welfare are best segregated from other uses.” The General Plan further states that “the Heavy Industrial designation is applied only to areas where heavy industrial uses presently predominate.”

According to the General Plan, the Public/Quasi-Public land use “category is used to designate public land uses, including schools, colleges, corporation yards, homeless shelters, libraries, fire stations, water treatment facilities, convention centers and auditoriums, museums, governmental offices, and airports.” In addition, this category is used to designate lands used by some private entities,

⁹ The Tulare Hill portion of the 126-acre parcel under Calpine/Bechtel's control is designated “Non-Urban Hillside” on the San Jose Land Use Diagram. The Non-Urban Hillside designation would remain unchanged.

including public utilities¹⁰. On November 8, 1999, the San Jose City Council approved a General Plan text amendment (GP99-T-1) to clarify that the Public/Quasi-Public category is also used to designate lands used by “any [private] organization involved in the provision of public services, such as gas, water, electricity, and telecommunications” (SJ 1999d). According to the City staff report, the intent of the text amendment was in part to reflect the deregulation of the electric utility industry. Thus, an electric generation facility proposed by a “non-public” utility, such as Calpine/Bechtel’s Metcalf Energy Center, would be consistent with the Public/Quasi-Public General Plan designation.

The City Council is expected to make its decision on the General Plan amendment in Fall 2000. The Planned Development Rezoning/Prezoning and annexation proposals will be considered at that time as well.

Major Strategies

The Major Strategies are the principal objectives of the General Plan, and as such, they establish the basic framework for planning in San Jose (SJ 1994a). The Major Strategies of the General Plan and their applicability to the project are discussed below.

Economic Development

This major strategy is “designed to maximize the economic potential of the City’s land resources while providing employment opportunities for San Jose’s residents.” According to the General Plan, San Jose houses more employed residents than it has jobs, therefore its existing jobs/housing balance is “jobs poor.” This situation makes it difficult for San Jose to provide adequate urban services for its residents because residential use by itself does not generate sufficient revenues to pay for the service needs it generates. According to the General Plan, land uses that generate jobs (e.g., commercial and industrial uses) do not require as many public services and typically generate greater revenue (i.e., sales and property taxes) than residential use. Thus, the Economic Development Major Strategy strives to make San Jose a more “balanced community” by encouraging more commercial and industrial growth to balance existing residential development.

Discussion: Although the MEC would not provide many jobs, it is a relatively “capital-intensive” industrial use that would provide the City of San Jose approximately \$600,000 per year in property taxes (see the **SOCIOECONOMICS** section of this FSA). Because the MEC would employ so few people, and the electricity it would produce would go toward meeting an existing demand, the MEC would not cause a substantial increase in population that would put a demand on City services. Thus, staff concludes that the MEC would be supportive of the Economic Development Major Strategy. For further discussion on the Economic Development Major Strategy, please see the subsection of this analysis entitled Response to Public and Agency Comments.

¹⁰ For instance, PG&E’s Metcalf Substation is designated Public/Quasi-Public on the General Plan Land Use Diagram.

Growth Management

“The Growth Management Major Strategy addresses the need to balance the urban facilities and services of new development with the need to balance the City’s budget. Infill development within urbanized areas is identified as an important means of controlling service costs through increased efficiency.” New development is expected to pay for the infrastructure (e.g., streets, sewers, storm drains, and fire stations) required to support it.

Discussion: Development of the project in rural Coyote Valley would not constitute “infill” development. Infill development is development on vacant sites within an urbanized area. However, the project site is within the City of San Jose’s Urban Service Area, which is defined by the General Plan as an area where urban services and facilities are generally available, and where urban development requiring such services should be located. The project would connect to City domestic water and sewer pipelines that exist within a short distance of the site. A new 10.2-mile long recycled water supply pipeline would be constructed to deliver cooling water to the project. Because the MEC would be located in an area where urban services and facilities are generally available, the project would be consistent with the Growth Management Major Strategy. Please refer to the **SOCIOECONOMICS** section of the FSA for a discussion of the impacts of the project on urban services and facilities.

Downtown Revitalization

This major strategy “emphasizes the importance of a prominent and attractive Downtown as a catalyst that will bring new investment, residents, business visitors and new life to the center city.”

Discussion: The Downtown Revitalization Major Strategy is not applicable to the project.

Urban Conservation/Preservation

This major strategy “underscores the importance of protecting and enhancing San Jose’s neighborhoods to promote residents’ pride in the quality of their living environments.”

Discussion: Tulare Hill would separate the MEC from the nearest residential neighborhood. Because of this separation, the residential neighborhood would be protected from significant adverse land use impacts, such as noise impacts.

Greenline

“The Greenline Major Strategy is directed to preserving the scenic backdrop of the hillsides surrounding San Jose, preserving land that protects water, habitat, or agricultural resources and offers recreational opportunities.”

Discussion: The current architectural design of the power plant would not substantially block views of the surrounding hillsides. Please refer to the **VISUAL RESOURCES** section of the FSA for an analysis of the project’s potential effects on

views of the hillsides. Calpine/Bechtel proposes to preserve, in perpetuity, the 116-acre parcel that forms the southeast side of Tulare Hill (CH2MHILL 2000a). The applicant would provide funds for managed cattle grazing of Tulare Hill for the life of the power plant project. Managed grazing of nonnative grasses is intended to promote growth of native plants, which are habitat for the Bay checkerspot butterfly. As part of the project, Calpine/Bechtel would also make substantial improvements to the Fisher Creek riparian area. The applicant proposes to plant native trees that would double the amount of existing riparian habitat. Other improvements would include installing permanent fencing to prevent cattle from entering Fisher Creek, and removing non-natural debris from the stream (CH2MHILL 2000b). Please refer to the **BIOLOGICAL RESOURCES** section of the FSA for a more complete discussion of potential impacts to biological resources and proposed mitigation measures. The project would maintain a 100-foot setback from the Fisher Creek riparian area. A recreational trail, as shown on the General Plan Scenic Routes and Trails Diagram, could be accommodated within the 100-foot setback area. In summary, the project would preserve the scenic backdrop of the surrounding hillsides, would preserve land that protects water, habitat, and agricultural resources, and would offer recreational opportunities. Thus, the project would be consistent with the Greenline Major Strategy.

Sustainable City

This major strategy is a statement of San Jose's desire to become an environmentally and economically sustainable city. A "sustainable city" is a city designed, constructed, and operated to minimize waste, efficiently use its natural resources, and to manage and conserve them for the use of present and future generations.

Discussion: The power plant would use an average of 3.3 million gallons per day of reclaimed water for cooling purposes (Calpine/Bechtel, Project Description, August 16, 2000). The project's use of reclaimed water would provide a beneficial use for the City's wastewater, helping to reduce the City's discharge to San Francisco Bay. Thus, the project would be supportive of the Sustainable City Major Strategy.

Goals and Policies

Residential Land Use

In part, the Residential Land Use goals and policies reflect concerns for the protection of residential neighborhoods from incompatible land uses. Residential Land Use Policy #2 states that "residential neighborhoods should be protected from the encroachment of incompatible activities or land uses that may have a negative impact on the residential living environment"¹¹.

Discussion: A power plant can be incompatible with residential uses. The MEC site is within an area planned for industrial research and development, office, assembly, and manufacturing uses. Tulare Hill would separate the project from the nearest

¹¹ According to the San Jose General Plan, "should" signifies a directive to be honored in the absence of significant countervailing considerations.

residential neighborhood (Santa Teresa) located about 0.5 mile north of the site. Staff has found with mitigation that the project would not have significant adverse noise impacts on the sensitive receptors nearest to the MEC site. Because the nearest residential neighborhood is located farther from the MEC site than the nearest sensitive receptors, and separated from the site by Tulare Hill, the noise impacts would be less than significant. Staff did not evaluate the project's potential for adverse visual impacts on the nearest residential neighborhood since staff determined that the neighborhood would not have views of the site because of Tulare Hill. Staff has also found that the project would not cause significant adverse public health or traffic impacts. Because the power plant would not encroach upon a residential neighborhood and would not have a negative impact on the residential living environment, the project would be consistent with Residential Land Use Policy #2. Please see the **NOISE, PUBLIC HEALTH, TRAFFIC AND TRANSPORTATION**, and **VISUAL RESOURCES** sections of the FSA for more information).

Industrial Land Use

Industrial Land Use Policy #1 states that "industrial development should incorporate measures to minimize negative impacts on nearby land uses¹²." Industrial Land Use Policy #10 states that "interface problems between existing residential and new industrial areas should be resolved through the site design and discretionary permit process."

Discussion: Several rural residences are located within one mile of the power plant site. The nearest residence (sensitive receptor) is located about 1,150 feet south of the MEC site. The project incorporates noise reduction measures so that noise from the power plant would not exceed 49 decibels (dBA) at the nearest residence. This level is consistent with the long-term noise goal in the Noise Element of the City's General Plan for sensitive receptors (see the **NOISE** section of the FSA). Thus, the project would be consistent with Industrial Land Use Policy #1 in regards to noise impacts on nearby land uses since the project incorporates measures to lessen these impacts. However, because the nighttime ambient noise level at the nearest residence is very low (39 dBA), and staff considers an increase of 5 dBA above the lowest ambient noise level to be potentially significant, staff proposes additional mitigation at the nearest residence (sound-rated windows and air conditioning) to reduce noise impacts to a less than significant level. Please see staff's proposed condition of certification **NOISE-4** in the **NOISE** section of the FSA. The project also incorporates measures to reduce the negative visual impacts of the project on nearby land uses, and therefore would be consistent with Industrial Land Use Policy #1. However, staff has found visual impacts on nearby residences (at Blanchard Road) to be significant since the MEC would substantially change the character of the area from rural to industrial and substantially degrade high sensitivity views of moderately high quality. These impacts are unmitigable because proposed mitigation measures cannot substantially reduce these impacts due to the nature of the project. Staff has proposed additional mitigation to reduce

¹² "Minimize" is defined by the San Jose General Plan as "to reduce or lessen but not necessarily to eliminate."

the residual visual impacts of the project on existing land uses, although still not to a less than significant level. Please refer to the **VISUAL RESOURCES** section of the FSA for a more thorough discussion of the visual impacts of the project and proposed mitigation measures to lessen these impacts on nearby land uses.

Urban Design

The City's urban design goal is to "require the highest standards of architectural and site design for all development projects, both public and private." The General Plan sets forth the following policies to achieve this goal.

Urban Design Policy #1 states that "the City should continue to apply strong architectural and site design controls on all types of development for the protection and development of neighborhood character *and for the proper transition between areas with different types of land uses*" (emphasis added). Policy #22 states that "design guidelines adopted by the City Council should be followed in the design of development projects."

Discussion: The City of San Jose is particularly concerned about the project's compatibility with the Campus Industrial uses that North Coyote Valley was intended to accommodate. The applicant has proposed mitigation measures to lessen the visual contrast between the power plant and planned campus industrial development. The proposed visual screening has been designed to simulate the appearance of an office building. In addition, the project's lower profile buildings and structures are oriented to the southern portion of site to provide for a compatible transition between the taller elements of the project and the planned Campus Industrial uses (which are allowed to be built to a maximum height of 120 feet). However, staff has found the project, with its proposed architectural design to be visually incompatible with the planned Campus Industrial uses. Staff has proposed additional mitigation measures to make the project more visually compatible with expected development. Please refer to the **VISUAL RESOURCES** section of the FSA for additional information. City staff has stated that the project would be required to comply with the North Coyote Valley Campus Industrial Area Master Development Plan, the design guidelines adopted by the City Council to guide development of North Coyote Valley (SJ 1999b). Compliance with the Master Development Plan guidelines is discussed later in this analysis and in the **VISUAL RESOURCES** section of the FSA.

Urban Design Policy #2 states that private development should include adequate landscape areas, which utilize water efficient plant materials and irrigation systems and include provision for ongoing maintenance.

Discussion: According to the September 2000 Planned Development Zoning application for the project, proposed landscape areas, including the Fisher Creek riparian corridor, would cover 44.5 percent of the MEC site. All planting areas on the site would be watered with an approved automatic underground irrigation system that would be designed to make efficient use of water through conservation techniques. Maintenance of the riparian trees and shrubs would extend for a period of at least two years. Maintenance would include weed control, irrigation, and

monitoring for grazing. Plant mortality surveys would be conducted on a periodic basis for a period of 3 to 5 years after initial planting to determine replanting needs (CH2MHILL 2000b). For a more thorough discussion, please see the **BIOLOGICAL RESOURCES** section of the FSA. With the exception of the coast redwoods, all of the proposed trees and shrubs are water efficient. The coast redwoods have been chosen because they are tall growing, evergreen trees that would provide maximum visual screening of the power plant. The AFC does not mention a provision for ongoing maintenance of the landscaped areas planted for aesthetic screening. However, the **VISUAL RESOURCES** section of the FSA proposes a condition of certification that would require ongoing maintenance and replacement of unsuccessful plantings. If the project complied with this condition, it would be consistent with Urban Design Policy #2.

Urban Design Policy #11 establishes a maximum building height of 120 feet for the Campus Industrial designated areas of North Coyote Valley, and a maximum height of 95 feet in any area designated for Public/Quasi-Public uses. Urban Design Policy #11 also allows height limits to be established in the context of project review “for structures, other than buildings, where substantial height is intrinsic to the function of the structures and where such structures are located to avoid significant adverse effects on adjacent properties.”

Discussion: The project has been designed to meet the 95-foot height limit for all proposed buildings and structures except the 145-foot tall Heat Recovery Steam Generator (HRSG) stacks and some ancillary structures. In a letter (dated September 28, 1999) commenting on Calpine/Bechtel's PD Zoning application, City staff stated that the height exception allowed by Urban Design Policy #11 potentially could be applied to the MEC. To determine applicability of Urban Design Policy #11, the City requested supporting information to justify the need to exceed the 95-foot height limit for Public/Quasi-Public uses. In their response (dated February 16, 2000), Calpine/Bechtel explained that 145-foot tall HRSG stacks was determined by air quality modeling as the height necessary to provide for adequate dispersion of the MEC's emissions under all meteorological conditions to prevent significant adverse impacts to local air quality. The location of the ancillary structures above the HRSG steam drums was explained as necessary to the function of the HRSGs. In their July 26, 2000 comments on the PD Zoning application, City staff requested the applicant to make the following notation in their application: “the height of all buildings and structures shall not exceed 95 feet with the exception of the heat recovery steam generator unit stacks for which the maximum height is 145 feet. A final determination on the applicability of the height exception to the project, and therefore compliance with Urban Design Policy #11, will be made this Fall when the City Council considers Calpine/Bechtel's Planned Development Zoning request.

Trails and Pathways

The City's trails and pathways goal is to “provide a network of trails and pathways throughout the City in order to maximize the City's recreational opportunities and to provide alternate means of reaching regional parks and other natural areas.”

Policies set forth to achieve this goal include the following. Policy #1 states that “the City should control land development along designated Trails and Pathways

Corridors in order to provide sufficient trail right-of-way and to ensure that new development adjacent to the corridors does not compromise safe trail access nor detract from the scenic and aesthetic qualities of the corridor.” Policy #2 states that “when new development occurs adjacent to a designated Trails and Pathways Corridor, the City should encourage the developer to install and maintain the trail.” Policy #7 states that “trails should be built to meet the trail standards established by the Department of Public Works. Trail design should provide sufficient light, vertical and horizontal clearance, and landscape setbacks from adjacent development to ensure a safe and aesthetically pleasing recreational experience.”

Discussion: The General Plan Scenic Routes and Trails Diagram shows a recreational trail running along Fisher Creek. The project would maintain a 100-foot setback from the Fisher Creek riparian corridor. Within the setback area, sufficient trail right-of-way could be accommodated along the south/east side of Fisher Creek. Thus, the project would be consistent with this part of Trails and Pathways Policy #1. However, staff has found that the project would have substantial visual impacts for views from the designated trail corridor along Fisher Creek and would detract from the scenic and aesthetic qualities of the corridor. Thus, the project would not comply with Policy #1 (please see the **VISUAL RESOURCES** section of the FSA). Although the current landscape plan for the project does not depict a trail within the Fisher Creek riparian setback area, the Planned Development Zoning application notes a trail as a permitted use within the riparian area. Calpine/Bechtel has indicated willingness to construct a trail along their property when and if it could be connected to a trail network in the area (Calpine/Bechtel, PSA Comments, Set 4, p. 4). Staff believes this is reasonable since it is staff’s understanding that the exact alignment of a trail in this area, as well as connections to the Coyote Creek Parkway has not been determined by the public agencies responsible for trail development. Potential connections to a trail on the MEC property could come from either north of the site from the Santa Teresa neighborhood and around Tulare Hill or from the south when the adjacent agricultural property (Passantino) is developed for campus industrial or other uses. Staff has proposed a condition of certification (**LAND-1**) requiring Calpine/Bechtel to build and maintain that portion of the Fisher Creek trail crossing the MEC site at such time as it could be connected to a larger trail network. The condition requires the trail to be constructed to the trail standards established by the Department of Public Works. If the project complied with staff’s proposed condition of certification, the MEC would be consistent with Trails and Pathways Policies #2 and #7.

Riparian Corridors

Riparian Corridor Policy #2 states that “new public and private development adjacent to riparian corridors should be consistent with the provisions of the Riparian Corridor Policy Study.”

Discussion: In regards to land use, staff has evaluated the MEC’s consistency with four applicable guidelines contained in the Riparian Corridor Policy Study. The project would be inconsistent with two of these guidelines. For additional information, please see the discussion on the Riparian Corridor Policy Study in this subsection of this analysis.

Policy #3 states that “new development within the Urban Service Area should be set back from the outside edge of riparian habitat (or top of bank, whichever is greater) a distance sufficient to buffer the impacts of adjacent human activities and provide avenues for wildlife dispersal.”

Discussion: As described in the Riparian Corridor Policy Study, under specified circumstances, the City of San Jose allows exceptions to the minimum 100-foot setback from riparian corridors. Given the intensity of the proposed project, the City of San Jose determined that the full 100-foot setback would be appropriate in this case (SJ 1999c). In response, the applicant revised the project to ensure that all structures would be set back a minimum of 100 feet from the Fisher Creek riparian corridor. Therefore, the project is consistent with Riparian Corridor Policy #3.

Policy #4 states that “new development should be designed to protect adjacent riparian corridors from encroachment of lighting, exotic landscaping, noise, and toxic substances into the riparian zone.”

Discussion: The project would be designed to protect the adjacent Fisher Creek riparian corridor from the encroachment of lighting, exotic landscaping, and toxic substances. The **VISUAL RESOURCES** section of the FSA proposes a condition of certification requiring all project lighting to be shielded to prevent off-site glare. If the project complied with this condition, it would be consistent with Riparian Policy #4 in regard to lighting. The planned improvements to the Fisher Creek riparian habitat would include only native tree and shrub species, so the project would be consistent with Policy #4 in regard to encroachment of exotic landscaping. The project would include secondary containment at the aqueous ammonia unloading/storage area to prevent the contents of the storage tank or a delivery truck from entering the riparian corridor in the event of a spill. Materials storage areas for other hazardous materials, such as sulfuric acid, phosphate and sodium hypochlorite, would include containment structures (i.e., berms). Therefore, staff expects that the project would be consistent with Policy #4 in regard to toxic substances. For more information please refer to the **HAZARDOUS MATERIALS MANAGEMENT** and the **SOIL AND WATER RESOURCES** sections of the FSA. The project incorporates noise reduction measures. Staff estimates operational noise of 50 to 65 dBA at Fisher Creek. At this noise level, staff does not expect the project to have significant adverse impacts on wildlife. Please refer to the **BIOLOGICAL RESOURCES** section of the FSA for a detailed discussion. In summary, the MEC would be designed to protect the Fisher Creek riparian area from the encroachment of lighting, exotic landscaping, noise, and toxic substances, so it would be consistent with Riparian Corridor Policy #4.

Agricultural Lands and Prime Soils

The City of San Jose has been built on prime soils, and most of the remaining vacant valley floor land in San Jose, including most of Coyote Valley, is designated as prime farmlands by the State of California Department of Conservation Important Farmlands Inventory. According to the General Plan, preservation of all prime soil land would mean a virtual halt to urbanization and is not a reasonable goal.

Therefore, the City's goal is to avoid the premature conversion of agricultural lands to urban uses.

Discussion: In 1983 the City of San Jose amended its General Plan to allow development of rural North Coyote Valley. The expected campus industrial uses never materialized, so much of the area has continued to be farmed, including a portion of the MEC site. Thus, development of the MEC would not constitute "premature" conversion of agricultural land, so the project would be consistent with this goal.

NORTH COYOTE VALLEY CAMPUS INDUSTRIAL AREA MASTER DEVELOPMENT PLAN

A power plant is clearly not a use envisioned by the Master Development Plan, which is intended to guide development of a "high-technology" light industrial park. The proposed Coyote Valley Research Park (CVRP), an approximately 400-acre campus consisting of 6.6 million square feet of office, research and development, assembly, and light manufacturing uses is the type of development planned for this area of San Jose. As stated in the Master Development Plan, the City's general goals for North Coyote Valley are "to provide much-needed, large, single-user sites where major companies can consolidate their operations and; 2) by doing so, ensure the region's long-term economic health." While the MEC would not be a labor intensive use, in keeping with the stated goals for North Coyote Valley, the project would be a "large, single-user site" and the electricity it would generate would go toward meeting an increasing electrical demand in a growing area, which would help to sustain the "region's long-term economic health."

City Planning staff has stated that the Master Development Plan is applicable to any development in North Coyote Valley regardless of General Plan designation (SJ 1999b). Thus, even if the City Council approves the General Plan amendment and changes the land use designation of the MEC site from Campus Industrial to Public/Quasi-Public to allow for a power plant, the project would still need to comply with the requirements of the Master Development Plan. In comments on the PSA, City staff stated that the MEC needs to meet or exceed the setback and landscaping requirements of the Master Development Plan. As stated in their letter, "this is critical given that the MEC is a heavy industrial use and needs adequate buffering to planned, neighboring Campus Industrial uses." In their July 26 comments on Calpine/Bechtel's PD Zoning application, City Planning staff reiterated its position stating that "the setbacks deemed to be appropriate for a less intensive campus industrial use should be considered as minimum standards for a heavy industrial use such as a power plant." Therefore, staff has analyzed the MEC's ability to meet the development guidelines and standards of the North Coyote Valley Campus Industrial Area Master Development Plan.

Private Improvement Guidelines

Of the Private Improvement Guidelines, the Master Development Plan reads:

"The Department of City Planning, Building and Code Enforcement will perform the design review which is mandatory for Campus Industrial zoning, and will use the Private Improvement Guidelines in that process. They are, therefore, written as

explicitly as possible, recognizing the fact that they will be enforced with a good deal of *discretion*” (emphasis added).

Those guidelines that pertain to architectural design, building site layout, and landscaping are addressed in the **VISUAL RESOURCES** section of the FSA.

Building Height

Overall building height shall not exceed the height limitations set forth in Urban Design Policy #11 of the General Plan.

Discussion: With the exception of the HRSG stacks and ancillary equipment, the project would comply with the 95-foot height limit for Public/Quasi-Public uses. Urban Design Policy #11 allows for additional height of structures, other than buildings, if substantial height is intrinsic to the function of the structure and where such structures are located to avoid significant adverse effects on adjacent properties. The 145-foot height of the HRSG stacks was determined by air quality modeling as the height required to provide for adequate dispersion of plant emissions under all meteorological conditions to prevent significant adverse impacts to local air quality. A final determination on the applicability of the height exception to the project, and therefore compliance with Urban Design Policy #11, will be made this Fall when the City Council considers Calpine/Bechtel’s Planned Development Zoning request.

Orchard Planting

Provide an equally spaced orchard-like landscape planting in parking areas. Minimum standards are 1 tree for every 4 standard parking spaces and 1 tree for every 5 compact spaces. The maximum size of any individual parking orchard area should not exceed two acres.

Discussion: The proposed landscape plan for the MEC parking area would not comply with this guideline. The proposed orchard trees and shrubs are not equally spaced “orchard-like” throughout the parking area but clustered around its edges. According to the Master Development Plan, the landscape treatment for parking lots, inevitably larger than any other use except open space, is prescribed to subdue automobiles as elements in the landscape. An orchard-like planting scheme would lessen the urban character of these large, visible parking areas and give them a more “rural” appearance. The MEC parking area would not be visible from Monterey Road or the adjacent property to the south since it would be completely screened by buildings and rows of Italian Cypress trees, orchard trees and redwoods. Another stated purpose of the parking lot landscape treatment is to provide shade and improve the comfort of drivers. Thus, staff has proposed a condition of certification (**LAND-2**) requiring the applicant to landscape the parking area consistent with this guideline.

Monterey Highway Edge

A 50-foot landscape easement will separate properties from the Union Pacific (formerly Southern Pacific) railroad right-of-way.

Discussion: Two small buildings originally proposed on the east side of the switchyard have been moved to the west side of the switchyard. As discussed in the PSA, in their original location, these two buildings interrupted the landscaping proposed along the eastern property boundary. The revised landscape plan in the current PD Zoning application (September 2000) shows a continuous row of Italian Cypress and orchard trees along the eastern property line. However, the proposed landscape area (single row of Italian Cypress trees) between the main structures of the MEC and the UPRR right-of-way would be less than 5 feet in width. The majority of the structure setback area (which ranges from 32 feet and 7 inches to 43 feet and 5 inches in width) contains an access road that encircles the power blocks. Thus, the project would not comply with this guideline for a 50-foot landscape easement to separate properties from the UPRR right-of-way. According to the Master Development Plan, the enforcement of this guideline is “discretionary.” However, City staff has stated that in this case, the project would need to “meet or exceed” the landscaping guidelines of the Master Development Plan. City staff has stated that the primary purpose of the 50-foot wide landscape easement is to screen views toward the campus industrial area, such as views from passenger trains and Monterey Road (SJ 2000b). Staff has found the visual impact to viewers on passenger trains and travelers along Monterey Road to be less than significant, primarily due to the short duration of these views (please refer to the **VISUAL RESOURCES** section of the FSA). Thus, noncompliance with this guideline would not result in a significant adverse environmental impact. Clearly, a landscape buffer of greater depth between the MEC site and the UPRR tracks would provide additional screening benefits for viewers on passenger trains and Monterey Road by filling in any gaps between trees. As the project is currently configured, there is insufficient space to accommodate both a 50-foot wide landscape easement along the eastern boundary and a 100-foot setback from the Fisher Creek riparian area on the west. It would appear that there might be some space between the proposed row of Cypress trees and the MEC fence line to accommodate additional landscaping. The **VISUAL RESOURCES** section of the FSA includes a condition of certification requiring the applicant to submit a landscaping plan for review and approval prior to operation of the power plant. It should be noted that the applicant proposes to install a substantial number of Black Walnut trees offsite along the western edge of Monterey Road, between the road and the railroad tracks. While these Black Walnut trees would not help to screen views toward the site from passenger trains, these trees would help to screen the views of travelers along Monterey Road. Staff has proposed a condition of certification (**LAND-3**) to ensure that the structure and building setbacks to the eastern property line are at a minimum those proposed by the applicant in their response to staff’s Informal Land Use Data Request (September 1, 2000) and their letter to Kent Edens, City Deputy Director of Planning (August 18, 2000).

Entry Identification

Direction signs to major property entrances should be located not less than 100 feet from the intersection. Identity signs will be located on the entry drive median. Gatehouses must be located at least 50 feet from face of curb.

Discussion: Staff's review of the applicant's preliminary draft Planned Development Permit, which is the step after the PD Zoning process in the City's entitlement process that addresses such details as signage, does not indicate that the applicant proposes any signs for the project. Staff has proposed a condition of certification (**LAND-4**) that would require any proposed directional signs, identity signs, and gatehouses to comply with the North Coyote Valley Campus Industrial Area Master Development Plan guidelines.

General Development Plan Standards

Of the General Development Plan Standards, the Master Development Plan reads:

"The guidelines which follow are an integral part of the General Development Plan and *are part of each site zoning*. These development guidelines are intended to establish the minimum framework within which specific project plans will be prepared. As such, they provide the elements of control which will assure a high level of quality and overall design consistency for the project area" (emphasis in italics added).

Most campuses should be planned at a size of at least 20 acres.

Discussion: The project would be developed on a 20-acre site, therefore it would comply with this standard.

The aggregate parcel coverage of all buildings exclusive of covered pedestrian walks and parking structures shall not exceed 30 percent.

Discussion: The proposed buildings and facilities would cover 26.5 percent of the site (Calpine/Bechtel, 2000d). Thus, the project would comply with this standard.

From site boundaries between Campus Industrial uses, but which do not abut public streets, the minimum setbacks shall be 100 feet for all buildings and structures and 15 feet for all uncovered off-street parking areas.

Discussion: The warehouse/maintenance shop, administration building (with control room), water treatment building/laboratory, and the gas compressor building are only set back 70 feet from the southern property boundary (Calpine/Bechtel, 2000d). The property adjacent and to the south of the MEC site is currently used for agriculture but designated Campus Industrial on the General Plan. Although the MEC is not a Campus Industrial use, City staff has stated that the project would need to comply with the setback requirements of the Master Development Plan. Staff proposed a condition of certification in the PSA requiring the applicant to revise the project so that all buildings and structures could be set back 100 feet from the southern property line. The applicant indicated that to meet the 100-foot setback the MEC site would have to be extended further south onto the adjacent agriculture property. The applicant objected to this condition stating that the owners (Passantino's) of the agricultural property to the south of the MEC site prefer to continue farming as much of their land as possible (PSA Comments Set 7; Letter from Ken Abreu, MEC Development Manager, to Kent Edens, San Jose Deputy

Director of Planning). In the alternative, the applicant has negotiated a restrictive covenant agreement that establishes a 130-foot strip of land on the Passantino property. Such covenant would ensure that no buildings or other permanent structures would be constructed, installed or maintained within the Setback Area in violation of the applicable ordinances, plans, and regulations of the City of San Jose. Within that 130-foot strip of land, a 30-foot-wide Open Space Easement that would be landscaped at such time as the Passantino property converts from agriculture to Campus Industrial. Until that time, the Open Space Easement would remain in agricultural use. Along with condition of certification **LAND-3** (which requires a minimum of a 70-foot setback), staff believes that this approach would meet the objective of the Master Development Plan to maintain a 200-foot separation between any buildings on adjacent properties (condition of certification **LAND-5**).

From all boundaries that abut the existing Fisher Creek right-of-way, the minimum setbacks shall be 100 feet for all buildings and structures and 50 feet for all uncovered off-street parking areas.

Discussion: The setback from the Fisher Creek right-of-way for all proposed buildings, structures, and parking areas would be a minimum of 100 feet, so the project would comply with this standard. Staff has proposed a condition of certification that would commit the MEC to maintain a 100-foot setback from the Fisher Creek riparian area (**LAND-3**).

All setback areas shall be landscaped.

Discussion: The setback areas from the western (Fisher Creek) and southern property boundaries would be landscaped. Two small buildings originally proposed on the eastern side of the switchyard interrupted the landscaping along the eastern property line. The current site plan shows these two buildings relocated to the western side of the switchyard (Calpine/Bechtel, PSA Comments Set 7). The revised landscape plan (in the September 2000 PD Zoning application) now shows a continuous row of trees along the eastern property line. Therefore, the project would be compliant with this standard since all setback areas would be landscaped.

A minimum of 25 percent of the total surface area of each parcel shall be landscaped. The Planning Director may allow the inclusion of natural open space in the project's landscaping area when he finds that such inclusion will: 1) meet the intent of the above requirement; 2) preserve significant natural amenities such as trees and terrain features; or 3) enhance the overall level of project quality.

Discussion: The landscaping proposed along the access road, UPRR right-of-way, and southern property boundary would cover about 19 percent of the MEC site. The applicant proposes to make substantial improvements to the Fisher Creek riparian area on the MEC site. With the inclusion of the Fisher Creek riparian area, 44.5 percent of the MEC site would be covered in landscaping (Calpine/Bechtel, September PD Zoning application). Thus, the project would appear to comply with this standard.

Off-street parking shall be provided at a ratio of one space per 350 square feet of gross floor area.

Discussion: According to the September 2000 PD Zoning application, the project would provide 16 on-site parking spaces. The proposed buildings on the project site would total 26,220 square feet of gross floor area. According to the required parking ratio, the project would need to provide 75 parking spaces. This is excessive for a project that would only employ a total of 20 workers. There will be about 12 employees on site during the daytime shift (Calpine/Bechtel, Response to Informal Land Use Data Request, September 1, 2000). In addition to these employees will be an occasional delivery person, service contractor, or sales representative. Provision of 16 parking spaces should be sufficient for this project.

All truck loading and unloading areas are to be separated from automobile parking areas and from all pedestrian and bicycle circulation elements.

Discussion: The ammonia unloading area would be separated from the automobile parking area. However, the warehouse/maintenance shop and water treatment building/laboratory would be accessed via the automobile parking area. The applicant expects large trucks to deliver components and materials to these buildings (Calpine/Bechtel, Informal Land Use Data Request). Since all truck loading and unloading areas would not be separated from automobile parking areas, the project would not comply with this standard. However, this standard is more applicable to campus industrial sites with hundreds of employees and unrestricted public access. Public access to the MEC site would be limited, with only about 12 employees plus an occasional delivery person, service contractor or sales representative expected on a daily basis. Therefore, staff does not recommend modifying the project to comply with this standard.

Environmental Performance Standards

In the Planned Development zoning district, no primary or secondary use shall be so conducted as to cause the discharge of any waste material into or upon the ground, or the harmful discharge of any waste material into or within any sanitary or storm sewer system, into or within any water system or water, or into the atmosphere; and no use or activity shall be conducted or permitted which constitutes a menace to persons or property or which is dangerous, obnoxious, or offensive by reason of air pollution, odor, smoke, noise, dust, vibration, radiation, or fumes. In addition, no use shall be permitted or conducted where the same creates a public or private nuisance.

Discussion: Because the project would not cause the *harmful* discharge of air pollutants into the atmosphere, the project would be consistent with this standard. Please see the **PUBLIC HEALTH** section of the FSA. The project contains mitigation measures to reduce noise impacts to a less than significant level. In addition, operation of the MEC would not create odors, smoke, dust, vibration, radiation, or fumes that are dangerous, obnoxious, or offensive.

The Master Development Plan establishes specific environmental performance standards addressing transportation, noise, water quality, flooding, cultural resources, air quality, and hazardous materials. Please refer to the **TRAFFIC AND TRANSPORTATION, NOISE, SOIL AND WATER RESOURCES, CULTURAL RESOURCES, AIR QUALITY**, and **HAZARDOUS MATERIALS MANAGEMENT** sections of the FSA.

RIPARIAN CORRIDOR POLICY STUDY

The following guidelines are applicable to the project. Other applicable provisions are addressed in the **VISUAL RESOURCES, BIOLOGICAL RESOURCES**, and **SOIL AND WATER RESOURCES** sections of the FSA.

Guideline 1A: Orientation

Site activities should be oriented to draw activity away from the riparian corridor, for example, entrances, loading and delivery areas, noise generating activities and equipment, and activities requiring night lighting should be oriented toward non-riparian property edges.

Discussion: Entrances, loading and delivery areas would be oriented away from Fisher Creek riparian corridor. In addition, the visual resources section of the FSA requires all lighting to be shielded to prevent off-site glare. In summary the project would be consistent with this guideline regarding lighting, loading, and entry. The project would not comply with this guideline regarding noise-generating equipment. While the components of the project that would produce the highest noise levels, such as the turbines, are located away from the riparian edge of the property, the cooling tower and electrical switchyard are located along the riparian edges of the property. Relocating the cooling tower to an area along the southern property line would place it in a more visually prominent location, increasing visual impacts. It should be noted that the project meets the goals of the City's Noise Element in regards to adjacent sensitive receptors (please refer to the **NOISE** section of the FSA). In addition, staff has found that the noise level produced by the MEC would not have a significant impact on wildlife in the Fisher Creek riparian area (please see the **BIOLOGICAL RESOURCES** section of the FSA). Staff does not recommend modifying the project to conform to this guideline.

Guideline 1B: Incompatible Land Uses

Incompatible operations and activities are discouraged within and adjacent to riparian setback areas to protect the health of existing vegetation and wildlife, reduce adverse cumulative impacts to water quality, and protect the quality of recreation uses in the corridor. Incompatible land uses include the following: land uses which typically generate littering and/or dumping; off-road vehicle use; removal of native vegetation; and those uses that create noxious odors, or use, store or create toxic materials (including fertilizers, herbicides, and pesticides), or generate high volumes of vehicular traffic.

Discussion: The project would not create noxious odors. Operation of the project would generate an insignificant amount of vehicle traffic. The project would use and store aqueous ammonia, which is toxic and could have an adverse effect on wildlife

in the event of an accidental release. However, the ammonia unloading and storage area would not be located adjacent to the 100-foot riparian setback area. In addition, all hazardous materials storage areas would include secondary containment. Therefore, the project would be compatible with the riparian area and compliant with this guideline. Please refer to the **HAZARDOUS MATERIALS HANDLING** section of the FSA for additional information.

Guideline 1C: Setback Areas

All buildings, other structures, impervious surfaces, outdoor activity areas, and ornamental landscaped areas should be separated a minimum of 100 feet from the edge of the riparian corridor (or top of bank, whichever is greater).

Discussion: All proposed buildings, structures, impervious surfaces, and ornamental landscaped areas would be separated a minimum of 100 feet from the Fisher Creek riparian corridor, so the project would comply with this guideline.

Guideline 2F: Noise

Noise producing stationary equipment should be located as far as necessary from riparian corridors to preclude exceeding the ambient noise level in the corridors.

Discussion: Staff estimates that the ambient noise level in the Fisher Creek riparian area would be similar to that at the nearest residence, which ranged from 42 dBA at 2:00 a.m. to 68 dBA at 9:00 p.m. (from **NOISE Table 2** in the **NOISE** section of the FSA). Noise from the power plant is estimated to be about 50 to 65 dBA at Fisher Creek. Thus, the project at certain times would exceed the ambient noise level in the Fisher Creek riparian area and would not be compliant with this guideline. It is likely that noise from the planned campus industrial uses also would exceed the ambient noise level in the riparian area. It should be noted that staff has found that the noise level produced by the MEC would not have a significant effect on wildlife in the Fisher Creek riparian area (please see the **BIOLOGICAL RESOURCES** section of the FSA).

SANTA CLARA COUNTY

GENERAL PLAN

Growth and Development: Countywide Issues and Policies

Coyote Valley is one of the few remaining non-urbanized areas of high quality soils and large-scale agricultural land holdings in the County (SCC 1994). As of 1980, the policies in the County's General Plan recommended that Coyote Valley should remain in agricultural or other non-urban uses. However, in 1983 the City of San Jose amended its General Plan to allow Campus Industrial development in the northernmost portion of Coyote Valley. The City designated the middle third and southernmost portions of Coyote Valley as "urban reserve" and "greenbelt" areas, respectively. The County's current policies recognize the need for flexibility regarding the future urban development of Coyote Valley (SCC 1994).

Countywide - Growth and Development Policy 14 (C-GD 14): Future urban development in Coyote Valley should be planned to realize the potential it holds for improving the City of San Jose's existing jobs-housing imbalance and for the benefit to the county as a whole, including:

- a. development of industrial and commercial land use in South San Jose prior to further housing development in order to alleviate commute hour traffic congestion along major north-south routes;
- b. reduced dependence on the automobile and increased use of public transit;
- c. an increased variety of housing opportunities; and
- d. opportunities for greenbelts.

Discussion: The proposed project is an industrial use and would be developed prior to development of the Coyote Valley Urban Reserve (CVUR). The CVUR is an area south of the North Coyote Valley Campus Industrial Area that may be considered for development in the future when the City needs additional housing resources (SJ 1994a). Employees at the proposed power plant may have the opportunity to utilize public transit. Currently, two bus lines stop on Santa Teresa Boulevard near the site. In addition, the North Coyote Valley Campus Industrial Area Master Development Plan proposes several public transportation system upgrades, such as bus and light rail, within the vicinity of the MEC site (Calpine/Bechtel 1999c, p. 8.4-15). Parts c and d of this policy are not applicable to the project. Because the project would be developed prior to housing development in Coyote Valley, and because public transit opportunities exist, the project would be consistent with Policy C-GD 14.

C-GD 17: Planning for Coyote Valley's future development should provide for the following in the area of resource conservation:

- a. permanent preservation of hillsides in open space;
- b. retention of a greenbelt of non-urban uses and densities between San Jose and Morgan Hill; and
- c. protection of a scenic corridor adjacent to Highway 101.

Discussion: The applicant proposes to permanently preserve Tulare Hill in open space, so the project is consistent with Policy C-GD 17. Part b is not applicable to the project. Consistency with part c is addressed in the **VISUAL RESOURCES** section of the FSA.

C-GD 18: Anticipated impacts on the South County cities [e.g., Morgan Hill and Gilroy] and other jurisdictions from development in Coyote Valley should be adequately mitigated to less than significant levels.

Discussion: Operation of the MEC would generate an insignificant amount of vehicle traffic and would not adversely affect the levels-of-service on roadways in the vicinity of the project. Staff has concluded that air quality impacts would be mitigated to a less than significant level. In addition, staff has found that the MEC would not cause significant adverse public health impacts. Thus, staff concludes

that the project would be consistent with this policy. Please see the **TRAFFIC AND TRANSPORTATION, AIR QUALITY**, and **PUBLIC HEALTH** sections of the FSA.

Land Use Policies: Rural Unincorporated Area Issues and Policies

Rural Land Use Policy 11 (R-LU 11): Allowable land uses in areas designated “Agriculture” shall be limited to:

- a. agriculture and ancillary uses;
- b. uses necessary to directly support local agriculture; and
- c. other uses compatible with agriculture which clearly enhance the long-term viability of local agriculture and agricultural lands.

Discussion: The power plant site is designated Urban Service Area on the Santa Clara County Land Use Plan, so this policy does not apply to the power plant site. The proposed transmission line route is designated Am (Agriculture – medium scale) on the County Land Use Plan. The MEC’s transmission line would connect to an existing transmission tower on Tulare Hill. Tulare Hill is currently used for grazing cattle, which the applicant proposes to continue for the life of the project. A new transmission line across Tulare Hill would not conflict with cattle grazing. Thus, the project would be consistent with Policy R-LU 11.

R-LU 74: In locating major gas and electric transmission distribution facilities¹³, the primary environmental considerations shall be to minimize aesthetic impacts and to avoid developed residential and/or public recreation areas.

Discussion: The proposed gas pipeline would travel through the Coyote Creek Parkway and would be inconsistent with the County’s policy to avoid public recreation areas. With staff’s proposed condition of certification (**LAND-8**), no significant adverse land use impacts are expected. Please see the subsection of this analysis entitled Compatibility with Existing and Planned Land Uses for a discussion of the gas pipeline’s potential impact on the Coyote Creek Parkway.

R-LU 75: Electric substations and gas control metering stations shall be located, designed, and landscaped to fit as inconspicuously and harmoniously as possible into the area in which they are required. Locations along scenic roads and heavily traveled highways should be avoided.

Discussion: The natural gas metering station would be located immediately adjacent to the PG&E gas main, just east of U.S. 101, and would be inconsistent with the County’s policy to avoid locations along heavily traveled highways. The applicant decided to locate the metering station near the PG&E gas main instead of at the MEC site to preserve PG&E’s option to construct, own, and operate the gas pipeline to the MEC site (Calpine/Bechtel, 2000f). The gas metering station would be

¹³ The Santa Clara County General Plan defines a gas transmission line as "a pipe installed for the purpose of transmitting gas from a source or sources of supply to one or more distribution centers or to *one or more large volume customers* or to interconnect sources of supply. In typical cases transmission lines differ from distribution mains in that they operate at higher pressures, they are longer, and the distance between connections is greater" (emphasis added).

classified as a “public utility and service use” in the Santa Clara County Zoning Ordinance. Santa Clara County allows public utility uses in any zoning district subject to securing a use permit. The Energy Commission has exclusive authority to permit the gas pipeline to the MEC, so a use permit from Santa Clara County will not be required. With mitigation proposed in the **VISUAL RESOURCES** section of the FSA, staff does not expect the gas metering station to cause any significant adverse visual impacts. Please see the subsection of this analysis entitled Compatibility with Existing and Planned Land Uses for further discussion of the gas metering station.

GENERAL LAND USE MANAGEMENT: URBAN UNINCORPORATED AREA ISSUES AND POLICIES

This section of the General Plan addresses the issues of general land use management and development within unincorporated lands within the cities’ Urban Service Area boundaries. Within a city’s Urban Service Area, Santa Clara County does not apply any General Plan designation or classification of prescriptive land uses or densities to unincorporated parcels. Instead, allowable land uses and densities are determined by the applicable city’s general plan.

In Santa Clara County, power plants are classified as “Major Public Utilities.” Major Public Utilities are allowed in any zoning district with a conditional use permit. For any application for a use permit involving unincorporated land within a city’s Urban Service Area, the County is required to provide the city with a form entitled “General Plan Conformance and Contiguity/Annexation Statement.” With this form, the County asks whether the proposed use conforms to the city’s General Plan and does the city intend to annex the site or has annexation been denied. The County could not approve a use permit for a project within the Urban Service Area that is inconsistent with the applicable city’s General Plan (Shoe 2000). Thus, even if the City of San Jose does not annex the unincorporated portion of the MEC site, the City’s General Plan continues to apply to the entire site.

COMPATIBILITY WITH EXISTING AND PLANNED LAND USES

POWER PLANT

CONSTRUCTION PHASE

During construction of the MEC, 10 acres of an agricultural field south of the site would be temporarily disturbed for a construction laydown area. Approximately 4 acres of the laydown area would be used for parking and temporary facilities. This area would be needed for roughly 24 months during project construction. Of the remaining 6 acres, all or part of this area would be in use for a shorter duration. Using the land for a construction laydown area would temporarily preclude its use for agriculture. Calpine/Bechtel would lease the land to compensate the landowner for the value of any lost crop production (Calpine/Bechtel 2000a, data response #226).

In parking and heavy traffic areas and those areas used for temporary facilities, measures the applicant would take to preserve the existing agricultural soil include:

covering the existing soil with a woven geotextile separator layer to protect underlying top soil; adding an additional layer of structural geogrid over the separator fabric in heavy traffic areas; and covering the geotextile layer with 8 to 12 inches of granular fill. To return these areas to their natural state after use, the granular fill and geotextile/geogrid would be removed and the soil would be tilled to thoroughly aerate. In those areas where heavy traffic protection is not required and soil conditions permit, no surface preparation would be taken and the laydown materials would be placed on appropriate wood dunnage. To return these areas to their natural state, the wood dunnage and materials would be removed and the soil would be tilled to thoroughly aerate (Calpine/Bechtel 2000a, data response #225). These mitigation measures are incorporated as staff's proposed condition of certification **LAND-6**.

Because the laydown area would only temporarily preclude agricultural production, and because the land would be restored to its original condition, the impact to agriculture would not be significant. Construction impacts, such as increased dust, noise, and traffic may affect nearby land uses. Please refer to the **AIR QUALITY** section of the FSA for a discussion of mitigation measures for controlling fugitive dust. Construction would be limited to daytime hours to reduce noise impacts on nearby land uses. Please refer to the **NOISE** section of the FSA for proposed mitigation measures. Construction traffic will increase congestion on local roadways; however, significant adverse impacts on the local transportation system are not expected. Please see the **TRAFFIC AND TRANSPORTATION** section of the FSA for a discussion of potential impacts and proposed mitigation measures.

OPERATION PHASE

Because agricultural uses predominate in the area surrounding the proposed site, the power plant would not disrupt or divide the physical arrangement of an established community.

The MEC site is classified as Prime Farmland on the 1998 Important Farmland Map for Santa Clara County (CDC 1999). Development of the project would result in the physical conversion of 20 acres of Prime Farmland (10 acres of which is currently in agricultural production) to non-agricultural use. The CEQA Environmental Checklist (Appendix G) does not provide guidance on the number of acres that would constitute a significant impact. Unlike many of the other questions in the checklist, the question on agricultural impacts avoids the use of qualifiers. The CEQA Checklist question is whether the project would convert Important Farmlands to non-agricultural use, not whether the conversion is "substantial" or "significant." Past practice by Energy Commission staff is to look to the affected local jurisdiction for guidance in determining the significance of impacts to agricultural land. For instance, in the Sutter Project, staff relied on significance criteria used by Sutter County that considered a "substantial" loss of agricultural land to be a significant impact (CEC 1998). Because the loss was not "substantial" as defined by Sutter County, the Sutter Project's impact to agricultural land was found to be insignificant. The Initial Study Checklist used by Santa Clara County states that a project may have a significant impact on agricultural resources if the project would convert 10 or more acres of farmland classified as prime in the report *Soils of Santa Clara County*

to non-agricultural use. According to Santa Clara County Planning staff, the 10-acre significance threshold is strictly adhered to unless mitigating circumstances can be found that the particular site is not viable for agriculture, such as being surrounded by land uses that would be incompatible with agriculture (e.g., a residential neighborhood) (Shoe 2000). Certainly a site such as the MEC site, which is partially being used for agriculture and is surrounded primarily by other agricultural uses, is viable for agriculture. The City of San Jose considers any loss of Prime Farmland to be significant (Moore 2000). For instance, in the EIR for the Almaden/Chynoweth Project (certified on August 4, 1998, Resolution #68388), the loss of approximately 40 acres of Prime Farmland was found to be an unavoidable significant impact of the project. Thus, based on the preceding discussion, staff concludes that the MEC would have a significant adverse impact on agriculture because it would convert 20 acres of Prime Farmland to non-agricultural use¹⁴.

Several rural residences are located in close proximity to the MEC site. These properties are planned for campus industrial uses and would likely redevelop at some time in the future. However, they could remain in rural residential use for an indefinite period of time. The nearest of these residences to the project is located about 1,150 feet south of the MEC site. As proposed by the applicant, the project would be designed so that noise from the power plant would not exceed 49 decibels at this residence. Measurements taken by the applicant indicate that the lowest ambient noise level at this residence is 39 decibels¹⁵. Staff considers an increase of five decibels above the lowest ambient noise level to be a significant adverse impact on sensitive noise receptors such as residences¹⁶. To mitigate this impact to a less than significant level, staff has proposed additional mitigation at any residence (sound-rated windows and air conditioning) that would be exposed to noise levels above 44 dBA. Noise impacts would be less than significant on other sensitive receptors in the area around the MEC site since they are located farther away, and in the case of the nearest residential neighborhood (Santa Teresa), Tulare Hill separates the neighborhood from the project site. Please refer to the **NOISE** section of the FSA for a more thorough discussion of the noise impacts of the project and mitigation measures proposed by staff to mitigate those impacts.

The power plant site is located at the northernmost end of an approximately 1,440-acre area planned for Campus Industrial uses. Development of a power plant at the site would preclude its development for Campus Industrial uses and introduce a heavy industrial use into an area not planned for such uses. The only campus industrial development proposed at this time in the area is the Coyote Valley Research Park (CVRP). The CVRP would be located south of Blanchard Road, west of Monterey Highway, and north of Bailey Avenue. The northernmost end of the CVRP property is located approximately 1,250 feet south of the MEC site. Three agricultural properties (location of the nearest sensitive receptors) located immediately south of the MEC site separate the project site from the proposed

¹⁴ This is consistent with the conclusion in the EIR prepared for PG&E's Northeast San Jose Transmission Reinforcement Project which found the conversion of 23 acres of Prime Farmland for the Los Esteros Substation to be a significant impact under CEQA.

¹⁵ Thirty-nine decibels is the average of the quietest nighttime hours.

¹⁶ An increase in noise of five decibels would be perceptible but not annoying.

CVRP. Since the project would meet the noise standards of both the Noise Element of the City's General Plan and the North Coyote Valley Campus Industrial Area Master Development Plan, staff would not expect the project would cause significant adverse noise impacts on the proposed campus industrial uses. In addition, these workers typically would be within closed office buildings, which would further reduce the noise impacts of the project by approximately 10 decibels.

In regards to the planned Fisher Creek trail, staff would not expect noise impacts to be significant on future recreational users of the trail. Recreational use of the trail would only occur during the day because trails in San Jose are closed after sunset (SJ 1999b). During the day, when recreational users would be present, noise from the MEC, although noticeable, would not be annoying to people using the trail since the ambient noise level would be higher in the area due to other sources such as traffic along Monterey Road. In addition, staff does not expect that those people using the trail would be exposed to the noise level for extended periods. Since the exposure period would be short, the impact would be less than significant.

Staff does not expect any significant adverse public health impacts from operation of the project (please refer to the **PUBLIC HEALTH** section of the FSA). Staff has also found that the project would not cause any significant unmitigated impacts as a result of the handling (including transportation) of hazardous materials, (please refer to the **HAZARDOUS MATERIALS HANDLING** section of the FSA).

Operation of the power plant would generate an insignificant amount of vehicle traffic and would not adversely affect the levels-of-service on roadways in the vicinity of the project. Please see the **TRAFFIC AND TRANSPORTATION** section of the FSA.

Staff has found that the MEC would have significant adverse visual impacts on nearby residences because it would substantially change the character of these views (from rural to industrial), and substantially degrade moderate to moderately high quality views with high visual sensitivity. Because of the nature of the project, no additional mitigation measures are feasible so the residual impacts on existing uses would be significant and unmitigable. Staff has also found that the power plant would substantially reduce visual quality for future Campus Industrial uses. In addition, staff has found that the MEC with its proposed architectural design would be visually incompatible with future buildings in the Campus Industrial area. Staff has proposed a condition of certification (**VIS-9**) to make the project more visually compatible with the expected Campus Industrial area. In addition to the project's design, any large and persistent visible water vapor plumes would substantially contribute to the MEC's visual incompatibility with planned development. Staff has proposed a condition of certification (**VIS-10**) that would propose rigorous standards for managing visible plumes. Please see the **VISUAL RESOURCES** section of the FSA for a more detailed discussion of the project's potential visual impacts and mitigation measures proposed by staff to lessen those impacts.

ELECTRICAL TRANSMISSION LINE

The proposed electrical transmission line between the power plant switchyard and the existing PG&E 230 kV transmission line would traverse undeveloped land. Thus, the proposed transmission line would not disrupt or divide the physical arrangement of an established community. The area is currently used for cattle grazing and is planned for agricultural uses. No new transmission towers would be constructed. Thus, the proposed transmission line would not conflict with existing or future land uses. It also would not convert any Prime Farmland to non-agricultural use. Therefore, the proposed electrical transmission line would be compatible with existing and planned land uses.

NATURAL GAS SUPPLY PIPELINE

Construction of the natural gas supply pipeline would take about 3 to 4 months and is expected to occur during the summer of 2002. Construction within the Coyote Creek Parkway is expected to take approximately 5 to 7 weeks (Calpine/Bechtel, 2000e). Construction workers for the pipeline would park in the construction laydown area for the MEC site and would be transported to the pipeline route by bus or van. Most major pieces of construction equipment may remain along the pipeline route during the course of construction. The MEC site would serve as the primary location for storing pipe and other materials. Any additional storage locations would be in existing paved or graveled areas along the pipeline route (Calpine/Bechtel 1999a, p. 6-3). Staff has proposed a condition of certification (**LAND-7**) to ensure that additional storage areas for pipeline materials would be located within existing paved or graveled areas. Because the use of storage areas along the pipeline would be temporary, and with staff's proposed condition would not displace any existing use, the impact would not be significant.

For the majority of the route, the pipeline would be installed using the trenching method. The exceptions are where it would be bored beneath U.S. 101 and directional drilled to go under Coyote Creek, Monterey Highway, and the UPRR tracks (Calpine/Bechtel 1999a, p. 6-3). Construction impacts, such as increased dust, noise, and traffic may affect nearby land uses. Please refer to the **AIR QUALITY**, **NOISE**, and **TRAFFIC AND TRANSPORTATION** sections of the FSA for a discussion of potential impacts and measures proposed by staff to mitigate those impacts. Staff spoke with a representative of the Santa Clara County Parks & Recreation Department who indicated that their primary concern with the gas pipeline crossing the Coyote Creek Parkway would be potential disturbances to park users during construction (Killough 2000). Large corporate events and family picnics are held at the Coyote Ranch during the months of April to October. To minimize potential disturbances to park users during construction of the pipeline through the Coyote Creek Parkway, staff has proposed a condition of certification (**LAND-8**) requiring the applicant to avoid conducting noisy and dusty construction activities while park events are occurring. In addition, as stated in comments on the PSA, the Santa Clara County Parks & Recreation Department will require Calpine/Bechtel to obtain "all necessary licenses and easement rights for construction and maintenance of the gas pipeline" within the Coyote Creek Parkway. Staff's condition of certification **LAND-8** requires the applicant to obtain

all necessary licenses and easements from the County to cross the Coyote Creek Parkway.

Except for the gas metering station, the natural gas supply pipeline would be underground for its entire length. Staff at the Santa Clara County Planning Department indicated that the primary concern with locating the gas metering station along U.S. 101 would be its potential visual impact to travelers on the highway (Shoe 2000). County staff recommended using vegetation, such as oleander, to screen the metering station from travelers on U.S. 101. Please refer to the **VISUAL RESOURCES** section of the FSA for a discussion of the potential visual impact of the gas metering station and the mitigation proposed by staff. Because the site is vacant, as is the immediate vicinity, the gas metering station would not preclude any existing use, nor would it disrupt or divide the physical arrangement of an established community. The metering station site is classified as non-prime agricultural land (Calpine/Bechtel 2000f). Thus, it would have an insignificant impact on agriculture. The gas pipeline would follow along existing roadways within the Coyote Creek Parkway and would travel within the area proposed for the power plant site access road and buffer landscaping. Therefore, once in place, the proposed natural gas supply pipeline would not preclude or unduly restrict existing or future uses. In addition, staff has found that the gas pipeline, with mitigation, would not present a significant risk to nearby land uses (please see the **HAZARDOUS MATERIALS HANDLING** section of the FSA). Therefore, with staff's proposed condition of certification, the natural gas supply pipeline would be compatible with existing and planned land uses.

WATER SUPPLY AND WASTEWATER PIPELINES

The majority of the 10.2-mile long recycled water supply pipeline would be constructed in paved city streets within residential and commercial areas. Construction impacts, such as increased dust, noise, and traffic may affect land uses along the pipeline route. Construction would progress at such a rate that no single residence would be affected for more than a few days (Calpine/Bechtel 1999e, p. 3-5). Construction laydown areas would be located at existing paved areas or along rights-of-way (Calpine/Bechtel 1999e, p. 3-4). Please refer to the **AIR QUALITY, NOISE, and TRAFFIC AND TRANSPORTATION** sections of the FSA for a discussion of potential impacts and mitigation measures.

Temporary impacts to agriculture may occur during construction of water pipeline Segment B-3 (recycled water supply pipeline, alternate domestic water supply pipeline, and wastewater discharge pipeline) and the domestic water supply pipeline. Construction would be timed to minimize disruption to agricultural activities (Calpine/Bechtel 2000a, data response #229). A portion of water pipeline Segment B-3 would pass through an orchard. The applicant would avoid direct loss of orchard trees by routing the pipelines between trees or through more open areas (Calpine/Bechtel 1999e, p. 3-3). Staff has proposed a condition of certification (**LAND-9**) requiring the applicant to avoid the direct loss of orchard trees as a result of the construction of the water pipelines. The owners of agricultural land affected by construction of the water pipelines would be compensated for the easement and value of any lost crop production. The level of compensation would be determined

during the applicant's negotiations for easement rights with the individual landowners (Calpine/Bechtel 2000c, data response #231).

The pipelines would be installed using the trenching method. The excavated soil would be stockpiled on one side of the trench and used for backfilling after the pipe is installed so that loss of the original soil order is minimized (Calpine/Bechtel 1999a, p. 6-3). Staff has proposed a condition of certification (**LAND-10**) requiring the applicant to minimize the loss of the original soil order as a result of pipeline construction through agricultural land. Standard erosion and dust control techniques, such as watering loose soil, would be used to minimize the loss of soil during construction of the pipelines. Please refer to the **AIR QUALITY** and **SOILS AND WATER RESOURCES** sections of the FSA for a discussion of proposed mitigation measures.

Because agricultural land disturbed during construction of the water pipelines would only temporarily preclude agricultural production, and because the land would be restored to its original condition, the impact to agriculture would not be significant. Water pipeline Segment B-3 and the domestic water supply pipeline would traverse lands under the control of the CVRP. Staff assumes that any potential conflicts between the pipeline routes and proposed buildings and structures on the CVRP site would be resolved during negotiations for easement rights.

Therefore, staff concludes that the water pipelines would be compatible with existing and planned land uses.

WESTERN ACCESS ROAD

Construction of the Western Access Road would convert approximately 2.5 additional acres of Prime Farmland to non-agricultural use. This conversion would contribute to the significant adverse impact that would be caused by development of the MEC site.

CUMULATIVE IMPACTS

The proposed MEC would contribute to the intensification of land use in Coyote Valley. This trend is anticipated in the City of San Jose General Plan, which has designated approximately 1,440 acres of land in North Coyote Valley for Campus Industrial uses. The recently proposed Coyote Valley Research Park would provide 6.6 million square feet of office, research and development, assembly, and light manufacturing uses on a 688-acre site (385 net acres). In addition to the Campus Industrial area, the Coyote Valley Urban Reserve, which would be located just south of the Campus Industrial area, would provide as many as 20,000 to 25,000 housing units. According to the City's General Plan, development of the Urban Reserve is expected outside of the planning horizon of the General Plan (1994-2020). The intensification of land use in Coyote Valley would be significant. However, the MEC would be a small component of the overall development of Coyote Valley and would not contribute substantially to this land use intensification. In addition, the project would not make a substantial contribution to regional impacts related to new

development and growth, such as population immigration and increased demand for public services.

The project would have a direct significant impact on agricultural resources (convert about 22.5 acres of Prime Farmland to non-agricultural use), as would other planned development in Coyote Valley since the majority of the valley is classified as Prime Farmland. Development of the CVRP project alone would result in the conversion of approximately 688 acres of Prime or Important Farmland (including a small portion designated as Grazing) to non-agricultural use. The MEC would contribute to a significant cumulative loss of agricultural land in Coyote Valley.

FACILITY CLOSURE

At some point in the future, the project will cease operation and close down. At that time, it will be necessary to ensure that closure occurs in such a way that public health and safety and the environment are protected from adverse impacts.

The information provided in the AFC did not specifically address the effects of project closure on land use issues and concerns. The planned lifetime of the project is 30 years (Calpine/Bechtel 1999a, p. 4-1). Prior to the initiation of decommissioning, the applicant would prepare a Facility Closure Plan for Energy Commission review and approval. At the time of closure, all applicable LORS would be identified and the closure plan would discuss conformance of decommissioning activities with these LORS.

There are at least two other circumstances under which a facility closure can occur: unexpected temporary closure and unexpected permanent closure. Staff has not identified any LORS from a land use perspective that the applicant would have to comply with in the event of unexpected temporary closure or unexpected permanent closure of the project.

MITIGATION

Staff has proposed conditions of certification to make the project consistent with some local policies, guidelines, and standards (**LAND-1** through **LAND-5**). To mitigate some impacts on agricultural land staff has proposed conditions of certification **LAND-6**, **LAND-7**, **LAND-9**, and **LAND-10**. To minimize potential disturbances to park users during construction of the natural gas supply pipeline through the Coyote Creek Parkway, staff has proposed condition of certification **LAND-8** requiring the applicant to avoid conducting noisy and dusty construction activities while park events are occurring.

RESPONSE TO PUBLIC AND AGENCY COMMENTS

DEPARTMENT OF PLANNING, CITY OF SAN JOSE

SJ-1 – *City staff state that throughout the PSA is a discussion of Santa Clara County policies and their applicability to the MEC. While City staff recognizes this as true for the portion of the project's linear facilities within unincorporated areas, it is the City's land use and development policies that are the guiding regulations for the MEC site since the site must be annexed into the City prior to any major development of the property.*

Individual sections of the Final Staff Assessment clarify that it is the City's laws, ordinances, regulations, and standards that are applicable to the MEC site.

SJ-2 - *City staff have concerns about the project's consistency with the General Plan's Economic Development Major Strategy. City staff is concerned that a power plant in North Coyote Valley would be detrimental to the City's efforts of attracting future campus industrial development to the area: "The North Coyote Valley Campus Industrial Area was very deliberately created to provide for an expansion of the City's tax and employment base... The substitution of a power plant for Campus Industrial uses has direct and indirect implications for the Economic Development Strategy - in terms of employment and tax base" (SJ 2000).*

Staff has included a discussion of the MEC's consistency with the Economic Development Major Strategy in the FSA (please refer to the subsection of this analysis entitled Consistency with Laws, Ordinances, Regulations and Standards). Staff believes that the MEC would be supportive of the Economic Development Major Strategy since it would generate about \$600,000 per year in property taxes for the City of San Jose.

In an August 16, 1999 letter to City Councilwoman Charlotte Powers, representatives of Coyote Valley Research Park (CVRP) expressed their concern that a power plant in North Coyote Valley "may well be incompatible" with the planned Campus Industrial uses. As stated in the letter, CVRP "want to fully understand the potential environmental, safety, visual and compatibility impacts associated with the MEC project." Staff has found that operation of the MEC would not cause any significant unmitigated noise impacts or public health and safety impacts (including from the use, storage, and transportation of hazardous materials). Staff has found that the project as proposed would be visually incompatible with expected campus industrial development and has proposed conditions of certification (**VIS-9** and **VIS-10**) to lessen the incompatibility impacts, including any impacts from visible water vapor plumes (please refer to the **VISUAL RESOURCES** section of the FSA).

Staff cannot say with any certainty that the MEC would discourage campus industrial development in North Coyote Valley, and uses the following example to explain this position. In North San Jose, a Cisco Systems light industrial park was built adjacent to the existing Agnews 30 MW cogeneration power plant. The Final

Environmental Impact Report (FEIR) prepared for the Cisco Systems project in North San Jose evaluated the potential for the Agnews power plant to cause land use compatibility conflicts with the Cisco project because of noise and the use of hazardous materials at the power plant. The Agnews power plant receives about 12,000 gallons of anhydrous ammonia every six weeks (Hooch 2000a). The FEIR concluded that the cogeneration facility would not cause significant land use incompatibility impacts with the proposed Cisco industrial park (SJ 1996). In the case of MEC, staff has found that the project, with mitigation, would have a less than significant effect on nearby land uses in regards to noise and the handling of hazardous materials. In regards to hazardous materials, the MEC proposes to use aqueous ammonia, which significantly reduces the risk that would be associated with use of the more hazardous anhydrous ammonia (please refer to the **HAZARDOUS MATERIALS HANDLING** section of the FSA). In regards to visual compatibility, although the Agnews cogeneration facility is much smaller in scale than the proposed MEC, it looks very much like a heavy industrial facility¹⁷. At the Agnews facility, there is very little in the way of screening or landscaping like what is being proposed for the MEC to reduce its visual contrast with planned campus industrial uses. Nevertheless, the Cisco industrial park was developed around the Agnews power plant.

SJ-3 - *City staff reiterated that the North Coyote Valley Campus Industrial Area Master Development Plan is applicable to any and all development in North Coyote Valley regardless of General Plan designation. Thus, City staff states that the MEC needs to meet or exceed the setback and landscaping requirements of the Master Development Plan.*

The FSA includes a discussion of the project's conformance with the North Coyote Valley Campus Industrial Area Master Development Plan development guidelines and standards. The project as proposed would not comply with two development guidelines and one development standard related to land use. Staff has proposed conditions of certification to resolve some of these inconsistencies. Please see the subsection of this analysis entitled Consistency with Laws, Ordinances, Regulations and Standards.

PARKS AND RECREATION, COUNTY OF SANTA CLARA

SC-2 – *The County Parks Department was pleased to see that the PSA included a condition of certification that the MEC construct a portion of the Fisher Creek trail. The County Parks Department would like to see the FSA “further address safe trail connections and access from the proposed Fisher Creek trail over Monterey Highway, Highway 101, and to/from Coyote Creek Parkway.”*

Staff has modified its proposed condition of certification (**LAND-1**). The condition still requires the applicant to construct that portion of the trail across the MEC site. However, the trail would be constructed at such time as when a trail connection can be made from either the south (currently privately held agricultural land) or from the

¹⁷ The tallest structure at the Agnews power plant is the HRSG stack, which is 55 feet tall [Hooch 2000b]

north (such as around the toe of Tulare Hill from the Santa Teresa neighborhood). Staff does not believe that the MEC should be required to provide the trail connections the County mentions in its comments. The project would employ very few people who could potentially use the trail. Conditioning the project to provide for these trail connections would be disproportionate to the project's impacts. These connections should be discussed in the context of all future development of the North Coyote Valley Campus Industrial area.

SC-3 – *The County Parks Department states that the MEC will be required to enter into an agreement with the County to secure all necessary licenses and easement rights for construction and maintenance of the natural gas supply pipeline within the Coyote Creek Parkway.*

Staff's proposed condition of certification (**LAND-8**) requires the MEC to obtain the necessary licenses and easement rights from the County to cross the Coyote Creek Parkway.

CONCLUSIONS AND RECOMMENDATION

CONCLUSIONS

Regarding consistency with LORS, Energy Commission staff concludes the following.

- The proposed MEC would be inconsistent with the City of San Jose's current General Plan and zoning designations of the site. The MEC site is currently designated Campus Industrial on the San Jose General Plan Land Use Diagram. This designation would not allow for a power plant such as the MEC. To resolve this nonconformity, the applicant filed an application for a General Plan amendment to change the land use designation of the site to Public/Quasi-Public, which would provide for development of a power plant. The applicant also requested a change in the agricultural zoning of the site. The San Jose City Council is expected to decide on the land use issues (i.e., General Plan amendment, Rezoning/Prezoning, and Annexation) this Fall. If the San Jose City Council acts to change the General Plan and zoning as requested by the applicant, the nonconformity with the General Plan and zoning ordinance would be resolved.
- With mitigation, the project would be substantially consistent with the applicable major strategies, goals and policies of the City's General Plan related to land use.
- The project would be inconsistent with the type of use envisioned for North Coyote Valley by the North Coyote Valley Campus Industrial Area Master Development Plan. However, the MEC would be supportive of the general goals of the Master Development Plan.

- As proposed, the project would not comply with two development guidelines and one development standard related to land use contained in the Master Development Plan. A condition of certification to ensure compliance with one of these guidelines is included in this analysis. Noncompliance with the other development guideline would not result in a significant adverse environmental effect. A proposed condition of certification to achieve the objective of the development standard is also included.
- The project would also be inconsistent with two guidelines in the Riparian Corridor Policy Study. However, noncompliance would not cause significant adverse environmental impacts that these guidelines were intended to avoid.
- The project would be inconsistent with two policies of the Santa Clara County General Plan. However, noncompliance would not cause significant adverse environmental impacts that these policies were intended to avoid.

Regarding compatibility with existing and planned land uses, staff concludes the following.

- The MEC would not disrupt or divide the physical arrangement of an established community.
- The project would have a significant unmitigated impact on agriculture since it would convert about 22.5 acres of Prime Farmland to non-agricultural use.
- With mitigation, the operation of the power plant would not cause significant adverse noise, public health or traffic impacts. Therefore, in regards to these impacts, the MEC would be compatible with existing and planned land uses.
- The power plant would have significant unmitigable visual impacts on nearby residences. No additional mitigation is feasible to reduce this visual impact. The power plant would substantially reduce visual quality for future Campus Industrial uses. In addition, the MEC would be visually incompatible with planned Campus Industrial uses. Staff has proposed mitigation measures (**VIS-9** and **VIS-10**) to lessen but not eliminate the visual impacts of the MEC on planned land uses.
- With mitigation, the project's linear facilities would not cause any significant land use impacts.

RECOMMENDATION

If the Commission decides to approve the MEC, the following proposed land use conditions of certification, and proposed conditions **VIS-9** and **VIS-10** to reduce the project's visual land-use incompatibility, should be adopted.

CONDITIONS OF CERTIFICATION

LAND-1 At such time as a connection to a trail network can be made either from north or south of the MEC site, the project owner shall install and maintain the portion of the planned Fisher Creek trail that would cross the MEC site.

Protocol: The project owner shall provide updates to the Energy Commission Compliance Project Manager (CPM) on trail developments in the area around the MEC site. The project owner shall submit for CPM review and approval designs for the trail along Fisher Creek on the MEC site and a plan for trail maintenance. The submittal shall include a schedule for when the project owner intends to complete construction of the trail segment. The submittal to the CPM shall include evidence that the City of San Jose Departments of Planning and Public Works have reviewed the trail design and maintenance plan and shall attach and address any recommendations from the City of San Jose.

Verification: In the Monthly Compliance Reports during construction, and the Annual Compliance Reports during operation, the project owner shall provide updates to the CPM on trail developments in the area around the MEC site. At least one hundred and eighty (180) days prior to the start of construction of a trail that the MEC trail could be connected to, the project owner shall submit designs and the maintenance plan to the CPM for review and written approval.

Within seven (7) days after completion of the trail segment, the project owner shall notify the CPM that the trail segment has been completed and is ready for inspection.

LAND-2 The project owner shall landscape the parking area consistent with the "Orchard Planting" Guidelines of the North Coyote Valley Campus Industrial Area Master Development Plan.

Verification: At least thirty (30) days prior to the start of construction of the power plant, the project owner shall submit to the CPM a revised landscape plan demonstrating that the landscaping within the parking area is consistent with the North Coyote Valley Campus Industrial Area Master Development Plan guidelines.

Within seven (7) days after completion of the landscaping, the project owner shall notify the CPM that the work has been completed and is ready for inspection.

LAND-3 The project owner shall design and construct the project to satisfy the following setback requirements:

From all power plant site (property) boundaries that abut the existing Fisher Creek right-of-way, the setbacks shall be one hundred (100) feet for all buildings and structures, and fifty (50) feet for all uncovered off-street parking areas.

From the southern property line, the setbacks for all buildings and structures shall be a minimum of seventy (70) feet and fifteen (15) feet for uncovered off-street parking areas.

No project facilities or structures shall be less than 32 feet from the power plant site's property boundary that abuts the Union Pacific right-of-way. The following facilities and structures shall be the specified minimum distance from the right-of-way:

The eastern combustion turbine's air inlet filter: 32 feet 7 inches.

The eastern turbine generator's main transformer: 42 feet.

The boiler feedwater pump enclosure: 37 feet 9 inches.

The Heat Recovery Steam Generator screening structure: 43.5 feet.

Protocol: The project owner shall submit to the CPM final design plans demonstrating that the specified setbacks will be provided. The project owner shall not start construction of the project until the project owner receives written approval of the final design plans from the CPM. When the project owner has surveyed the property to mark the boundaries of the specified facilities and structures, the project owner shall notify the CPM that the boundaries are available for inspection. The project owner shall not start construction of the specified facilities and structures until the CPM has approved the boundaries. When construction of the specified facilities and structures is completed, the project owner shall submit to the CPM a statement that the specified setbacks have been complied with along with documentation demonstrating compliance with the setback requirements, and shall notify the CPM when the facilities and structures are available for inspection.

Verification: At least sixty (60) days prior to the start of construction, the project owner shall submit the final design plans to the CPM. When the boundaries of the specified facilities and structures have been marked, the project owner shall notify the CPM that the boundaries are ready for inspection. Within seven (7) days after completion of construction of the specified facilities and structures, the project owner shall notify the CPM that the facilities and structures are completed and are ready for inspection.

LAND-4 The project owner shall ensure that any project directional signs, identity signs, and gatehouses comply with the "Entry Identification" guidelines of the North Coyote Valley Campus Industrial Area Master Development Plan.

Verification: At least ninety (90) days prior to the commercial operation of the power plant, the project owner shall submit to the CPM a site plan that demonstrates that the project complies with the "Entry Identification" guidelines of the North Coyote Valley Campus Industrial Area Master Development Plan.

Prior to the start of commercial operation of the power plant, the project owner shall notify the CPM that these requirements have been satisfied and that any project directional signs, identity signs, and gatehouses are ready for inspection.

LAND-5 The project owner shall acquire from the property owners (Passantino) immediately south of the MEC site a restrictive covenant agreement running with title that establishes a strip of land one hundred thirty (130) feet in width as a building setback (the "Setback Area"), beginning at the southern MEC property line. Such covenant shall ensure that no buildings or other permanent structures shall be constructed, installed or maintained within the Setback Area in violation of the applicable ordinances, plans, and regulations of the City of San Jose. Such covenant shall not prohibit the construction, installation, or maintenance of roads, driveways, parking areas, landscaping, fencing, lighting and utility facilities, signs, temporary trailers, farm-related fixtures, or other improvements as may be permitted by the applicable ordinances, plans, and regulations of the City of San Jose. Further, the project owner shall acquire an easement (the Open Space Easement) on a strip of land approximately thirty (30) feet in width along the northern boundary of the Lands of Passantino. The Open Space Easement area shall remain in agricultural production unless and until the Lands of Passantino are sold or convert to a Campus Industrial use. At such time, the project owner shall install landscaping within the Open Space Easement. The covenants, easements, and obligations that implement the Setback Area and Open Space Easement shall be perpetual and shall run with the land.

When the Lands of Passantino are sold or convert to a Campus Industrial use, the project owner shall submit a landscape plan for the Open Space Easement to the CPM for review and approval, and to the City of San Jose for review and comment.

Verification: At least ninety (90) days prior to the start of construction of the power plant, the project owner shall submit to the CPM a recorded copy of the Restrictive Covenant and Easement Agreement that establishes the Setback Area and Open Space Easement.

Within sixty (60) days of the Passantino property being sold or converting to Campus Industrial use the project owner shall submit a landscape plan to the CPM for review and approval and the City of San Jose for review and comment.

Within seven (7) days of completion of the landscaping, the project owner shall notify the CPM that the landscaping has been completed and is ready for inspection.

LAND-6 The project owner shall ensure the protection of soil while using agricultural land as a construction laydown and parking area. When the agricultural land is no longer needed as a construction laydown and parking area, but no later than the start of commercial operation of the power plant, the project owner shall restore the soil to its natural state for agriculture.

Protocol: In parking and heavy traffic areas and those areas used for temporary facilities, protective measures shall include but not necessarily be limited to: covering the existing soil with a woven geotextile separator layer to protect underlying top soil; adding an additional layer of structural geogrid

over the separator fabric in heavy traffic areas; and covering the geotextile layer with 8 to 12 inches of granular fill.

After use, the granular fill and geotextile/geogrid shall be removed and the soil shall be tilled to thoroughly aerate and remove all soil compaction.

In those areas where heavy traffic protection is not required and soil conditions permit, laydown materials shall be placed on appropriate wood dunnage.

After use, the wood dunnage and materials shall be removed and the soil shall be tilled to thoroughly aerate and remove all soil compaction.

Verification: At least thirty (30) days prior to the delivery of construction materials to the power plant laydown area, the project owner shall notify the CPM that the protective measures stated above will be applied prior to the delivery of any construction materials. Within seven (7) days after the protective measures have been applied, the project owner shall submit photographic evidence of the application. At least thirty (30) days prior to start of commercial operation, the project owner shall notify the CPM that the agricultural field used as the laydown area has been tilled and shall submit photographs of the tilled field.

LAND-7 The project owner shall ensure that any additional construction laydown areas needed along all pipeline routes are located within existing paved or gravel areas.

Verification: At least sixty (60) days prior to construction of the pipelines, the project owner shall submit to the CPM a detailed map showing the location of any planned laydown areas along the pipeline routes and photographs of the areas.

LAND-8 The project owner shall obtain all necessary licenses and easement rights from Santa Clara County to route the natural gas supply pipeline through the Coyote Creek Parkway. For that portion of the gas pipeline within the Coyote Creek Parkway, the project owner shall avoid performing noisy and dusty construction activities while permitted park events are occurring. The project owner shall coordinate with the Santa Clara County Parks and Recreation Department to identify specific dates of planned park events in order to minimize conflicts with these events.

Verification: At least thirty (30) days prior to the start of construction of the gas pipeline through the Coyote Creek Parkway, the project owner shall submit to the CPM a copy of all licenses and easements secured from Santa Clara County for construction of the pipeline through the Parkway. At least thirty (30) days prior to the start of construction of the pipeline through the Coyote Creek Parkway, the project owner shall submit to the CPM for review and approval a plan that describes how construction activities will be timed to avoid permitted park events. The submittal to the CPM shall include evidence that the Santa Clara County Parks and Recreation Department has reviewed the plan and shall attach and address any recommendations from the Parks and Recreation Department. The submittal shall

also include a schedule of anticipated park events. Once a week during pipeline construction, the project owner shall submit to the CPM an update of planned construction dates for the following week and a schedule of planned park events to occur within the same timeframe.

LAND-9 The project owner shall route the water supply and wastewater discharge pipelines through open agricultural areas to avoid the direct loss of orchard trees.

Verification: At least sixty (60) days prior to construction of the water supply and wastewater discharge pipelines the project owner shall submit to the CPM for review and approval a site plan that shows the precise alignment of the pipelines in relation to existing orchard trees. The site plan shall clearly delineate the width of the pipeline construction corridor.

At least seven (7) days prior to ground disturbing activities related to pipeline construction, the project owner shall notify the CPM that stakes have been installed to delineate the boundaries of the pipeline corridor and the route is ready for inspection.

LAND-10 During pipeline construction, the project owner shall stockpile excavated topsoil separate from subsoil in agricultural areas. The project owner shall backfill the trenches in a manner that minimizes the alteration of the original soil order.

Verification: At least thirty (30) days prior to ground disturbance related to pipeline construction, the project owner shall submit a description of the procedure to minimize alteration of original soil stratigraphy. At least seven (7) days prior to trenching, the project owner shall notify the CPM of the schedule for trenching. Within seven (7) days after the start of trenching, the project owner shall submit photographs to the CPM that demonstrates that the topsoil has been kept separate from the subsoil. At least seven (7) days prior to the backfilling of trenches, the project owner shall notify the CPM of the schedule for backfilling.

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LAND USE Figure 1
Proposed Power Plant Site

LAND USE Figure 2
Existing Land Uses Surrounding the MEC Site

LAND USE Figure 3
Existing Land Uses Surrounding the MEC Site

LAND USE Figure 4
Existing Land Uses Surrounding the MEC Site

LAND USE Figure 5
Existing Land Uses Surrounding the MEC Site

LAND USE Figure 6
City of San Jose General Plan Designations
within One Mile of the MEC Site

LAND USE Figure 7
Santa Clara County General Plan Designations
within One Mile of the MEC Site

APPENDIX A - LAND USE TABLE 1

SUMMARY OF THE MEC'S CONSISTENCY WITH APPLICABLE LAWS, ORDINANCES, REGULATIONS AND STANDARDS

	PROJECT CONSISTENT? (YES/NO)
City of San Jose General Plan	
Land Use Diagram - Campus Industrial Designation (Allowed land uses are industrial research and development, administration, marketing, assembly, and manufacturing.)	NO (Applicant has requested General Plan change to Public/Quasi-Public. If City Council approves, nonconformity would be resolved.)
Economic Development Major Strategy	YES
Growth Management Major Strategy	YES
Greenline Major Strategy	YES
Sustainable City Major Strategy	YES
Residential Land Use Policy #2 (Residential neighborhoods should be protected from the encroachment of incompatible activities or land uses that may have a negative impact on the residential living environment.)	YES
Industrial Land Use Policy #1 (Industrial development should incorporate measures to minimize negative impacts on nearby land uses.)	YES
Urban Design Policy #2 (Private development should include adequate landscape areas, which utilize water efficient plant materials and irrigation systems and include provision for ongoing maintenance.)	YES (with staff's proposed condition of certification)
Urban Design Policy #11 (Maximum structure height of 95 feet in any area designated for Public/Quasi-Public uses; additional height allowed where substantial height is intrinsic to the function of the structures)	NO (Project would exceed allowable height limit for Public/Quasi-Public. Applicability of height exception to be determined by City Council.)

Trails and Pathways Policy #1 (The City should control land development along designated Trails and Pathways Corridors in order to provide sufficient trail right-of-way and to ensure that new development adjacent to the corridors does not detract from the scenic and aesthetic qualities of the corridor.)	NO (The project would provide sufficient trail right-of-way but would detract from the scenic and aesthetic qualities of the Fisher Creek corridor.)
Trails and Pathways Policy #2 (When new development occurs adjacent to a designated Trails and Pathways Corridor, the City should encourage the developer to install and maintain the trail.)	YES (with staff's proposed condition of certification)
Trails and Pathways Policy #7 (Trails should be built to meet the trail standards established by the Department of Public Works.)	YES (with staff's proposed condition of certification)
Riparian Corridor Policy #2 (New public and private development adjacent to riparian corridors should be consistent with the provisions of the Riparian Corridor Policy Study.)	NO (Nonconformance will not result in significant adverse impacts to wildlife; see the Riparian Corridor Policy Study)
Riparian Corridor Policy #3 (New development within the Urban Service Area should be set back from the riparian habitat a distance sufficient to buffer the impacts of adjacent human activities and provide avenues for wildlife dispersal.)	YES
Riparian Corridor Policy #4 (New development should be designed to protect adjacent riparian corridors from encroachment of lighting, exotic landscaping, noise, and toxic substances into the riparian zone.)	YES
North Coyote Valley Campus Industrial Area Master Development Plan	
General Goals of Master Development Plan (To provide much-needed, large single user sites where major companies can consolidate their operations and by doing so, ensure the region's long-term economic health. Intended to accommodate "high-technology" users.)	Not a "high-technology" use; however, project would be supportive of goals.
<i>Private Improvement Guidelines</i>	
Overall building height shall not exceed the height limitations set forth in Urban Design Policy #11 of the General Plan	Compliance to be determined.
Provide an equally spaced orchard-like landscape planting in parking areas.	YES (with staff's proposed condition of certification)

LAND USE Table 1 (continued)
Summary of the MEC's Consistency with Applicable Laws, Ordinances, Regulations and Standards

A 50-foot landscape easement will separate properties from the Union Pacific Railroad right-of-way.	NO (Noncompliance would not result in a significant adverse visual impact)
Direction signs to major property entrances should be located not less than 100 feet from the intersection. Identity signs will be located on the entry drive median. Gatehouses must be located at least 50 feet from face of curb.	Insufficient information at this time to determine compliance; Would be consistent with staff's proposed condition of certification.
<i>General Development Plan Standards</i>	
Most campuses should be planned at a size of at least 20 acres.	YES
The aggregate parcel coverage of all buildings exclusive of covered pedestrian walks and parking structures shall not exceed 30 percent.	YES
From site boundaries between Campus Industrial uses, but which do not abut public streets, the minimum setbacks shall be 100 feet for all buildings and structures and 15 feet for all uncovered off-street parking areas.	NO (With staff's proposed condition of certification, the project would comply with the objective of this standard.)
From all boundaries that abut the existing Fisher Creek right-of-way, the minimum setbacks shall be 100 feet for all buildings and structures and 50 feet for all uncovered off-street parking areas.	YES
All setback areas shall be landscaped.	YES
A minimum of 25 percent of the total surface area of each parcel shall be landscaped.	YES
Off-street parking shall be provided at a ratio of one space per 350 square feet of gross floor area.	N/A

LAND USE Table 1 (continued)
Summary of the MEC's Consistency with Applicable Laws, Ordinances, Regulations and Standards

All truck loading and unloading areas are to be separated from automobile parking areas and from all pedestrian and bicycle circulation elements.	N/A
<i>Environmental Performance Standards</i>	
No primary or secondary use shall be so conducted as to cause the harmful discharge of any waste material into the atmosphere.	YES
Riparian Corridor Policy Study	
Guideline 1A: Orientation (Site activities should be oriented to draw activity away from the riparian corridor, for example, entrances, loading and delivery areas, noise generating activities and equipment, and activities requiring night lighting should be oriented toward non-riparian property edges.)	NO (Noncompliance would not result in a significant adverse impacts to wildlife.)
Guideline 1B: Incompatible Land Uses (Incompatible operations and activities are discouraged within and adjacent to riparian setback areas to protect the health of existing vegetation and wildlife, reduce adverse cumulative impacts to water quality, and protect the quality of recreation uses in the corridor.)	YES
Guideline 1C: Setback Areas (All buildings, other structures, impervious surfaces, outdoor activity areas, and ornamental landscaped areas should be separated a minimum of 100 feet from the edge of the riparian corridor (or top of bank, whichever is greater).	YES
Guideline 2F: Noise (Noise producing stationary equipment should be located as far as necessary from riparian corridors to preclude exceeding the ambient noise level in the corridors.)	NO (Noncompliance would not result in a significant adverse impacts to wildlife.)
Santa Clara County General Plan	
Policy C-GD 14 (Future urban development in Coyote Valley should be planned to realize the potential it holds for improving the City of San Jose's existing jobs-housing imbalance and for the benefit to the county as a whole)	YES
Policy C-GD 17 (Planning for Coyote Valley's future development should provide for the permanent preservation of hillsides in open space)	YES

LAND USE Table 1 (continued)
Summary of the MEC's Consistency with Applicable Laws, Ordinances, Regulations and Standards

C-GD 18 (Anticipated impacts on the South County cities [e.g., Morgan Hill and Gilroy] and other jurisdictions from development in Coyote Valley should be adequately mitigated to less than significant levels.)	YES
R-LU 11 (Allowable land uses in areas designated "Agriculture" shall be limited to: a) agriculture and ancillary uses; b) uses necessary to directly support local agriculture; and c) other uses compatible with agriculture which clearly enhance the long-term viability of local agriculture and agricultural lands.)	YES
R-LU 74: In locating major gas distribution facilities, a primary environmental consideration shall be to avoid public recreation areas.	NO (With proposed mitigation, no significant adverse land use impact.)
R-LU 75: In locating gas control metering stations, locations along heavily traveled highways should be avoided.	NO (With proposed mitigation, no significant adverse visual impact.)

TRAFFIC AND TRANSPORTATION

Testimony of Steven J. Brown, P.E.

INTRODUCTION

The Traffic and Transportation section of the Final Staff Assessment addresses the extent to which the Metcalf Energy Center (MEC) may impact the transportation system within the vicinity of its proposed location. These analyses included the evaluation of the influx of large numbers of construction workers, and how, over the course of the construction phase, they can increase roadway congestion and also affect traffic flow. The underground natural gas and water supply pipeline alternatives are proposed to cross or be located along a public right-of-way, requiring trenching or other activities disruptive to traffic flows. In addition, the transportation of large pieces of equipment can increase roadway congestion and increase traffic hazards. On-going (post construction) operations and maintenance traffic will be minimal; however, it can include a slight increase in the transportation of hazardous materials to the project site. In all cases, the transportation of hazardous materials will need to comply with federal and state laws.

Staff has used all available information to determine the potential for the MEC to have significant traffic and transportation impacts, and to assess the availability of mitigation measures that could reduce or eliminate those impacts. Conditions of certification are included to implement the appropriate mitigation measures and to ensure that the project complies with the applicable Laws, Ordinances, Regulations, and Standards (LORS).

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

FEDERAL

The federal government addresses transportation of goods and materials in Title 49, Code of Federal Regulations:

- Sections 171-177 govern the transportation of hazardous materials, the types of materials defined as hazardous, and the marking of the transportation vehicles.
- Sections 350-399, and Appendices A-G, Federal Motor Carrier Safety Regulations, address safety considerations for the transport of goods, materials, and substances over public highways.

STATE

The California Vehicle Code and the Streets and Highways Code contain requirements applicable to the licensing of drivers and vehicles, the transportation of hazardous materials and rights-of-way. In addition, the California Health and Safety Code addresses the transportation of hazardous materials. Specifically, these codes include:

- California Vehicle Code, Section 353, defines hazardous materials. California Vehicle Code, Sections 31303-31309, regulates the highway transportation of hazardous materials, the routes used, and restrictions thereon.
- California Vehicle Code, Sections 31600-31620, regulates the transportation of explosive materials.
- California Vehicle Code, Sections 32000-32053, regulates the licensing of carriers of hazardous materials and includes noticing requirements.
- California Vehicle Code, Sections 32100-32109, establishes special requirements for the transportation of inhalation hazards and poisonous gases.
- California Vehicle Code, Sections 34000-34121, establishes special requirements for the transportation of flammable and combustible liquids over public roads and highways.
- California Vehicle Code, Sections 34500, 34501, 34501.2, 34501.3, 34501.4, 34501.10, 34505.5-7, 34506, 34507.5 and 34510-11, regulates the safe operation of vehicles, including those which are used for the transportation of hazardous materials.
- California Health and Safety Code, Sections 25160 et seq., addresses the safe transport of hazardous materials.
- California Vehicle Code, Sections 2500-2505, authorizes the issuance of licenses by the Commissioner of the California Highway Patrol for the transportation of hazardous materials, including explosives.
- California Vehicle Code, Sections 13369, 15275, and 15278, addresses the licensing of drivers and the classifications of licenses required for the operation of particular types of vehicles. In addition, it requires the possession of certificates permitting the operation of vehicles transporting hazardous materials.
- California Streets and Highways Code, Sections 117 and 660-72, and California Vehicle Code, Sections 35780 et seq., require permits for the transportation of oversized loads on county roads.
- California Streets and Highways Code, Sections 660, 670, 1450, 1460 et seq., 1470, and 1480, regulates right-of-way encroachment and the granting of permits for encroachments on state and county roads.
- In accordance with California state law, the County of Santa Clara has adopted a Congestion Management Plan (CMP) for all transportation facilities within the County. The CMP is overseen by the Santa Clara Valley Transportation Authority. The CMP states that:
 - Level of Service D (LOS D) is to be achieved whenever practical; and
 - Level of Service E (LOS E) represents the maximum vehicles per day that any roadway can serve and still meet the minimum acceptable standard on the CMP roadway system.

LOCAL

SANTA CLARA COUNTY

The Santa Clara County General Plan (1994), includes the following policies which are pertinent to the proposed project:

Policy C-GD 14: Future urban development in Coyote Valley should be planned to realize the potential it holds for improving the City of San Jose's existing jobs-housing imbalance and for the benefit to the county as a whole, including:

- development of industrial and commercial land uses in South San Jose prior to further housing development in order to alleviate commute hour traffic congestion along major north-south routes;
- reduced dependence on the automobile and increased use of public transit;
- an increased variety of housing opportunities; and
- opportunities for greenbelts.

Policy C-GD 18: Anticipated impacts on the South County cities and other jurisdictions from development in Coyote Valley should be adequately mitigated to less than significant levels.

Policy C-GD 41: Cities should take maximum advantage of the development potential of their vacant land supply and underutilized industrial/commercial lands to achieve more balanced growth and development.

CITY OF SAN JOSE

The transportation and circulation element of the San Jose General Plan (1994) sets forth the following policies that are applicable to MEC project:

- The city's level of service standards for the state highway system and specific routes of regional significance shall be those standards adopted in the Santa Clara Congestion Management Program;
- The City shall require all new development projects to analyze their contribution to increased traffic and to implement improvements necessary to address the increase; and
- The California Streets and Highways code Division 2 Chapter 5.5 Sections 1460-1470 mandates that an encroachment permit be obtained from the City Public Works Department if there is an opening or excavation for any purpose in any highway.

It is the City of San Jose's policy that all new development maintain two points of access for emergency vehicles.

SETTING

The proposed MEC site is bounded by Fisher Creek on the North, Blanchard Road on the south, and Monterey Road/Union Pacific Railroad (UPRR) tracks on the east and the west.

The operating conditions of a roadway system are described using the term "level of service". Level of service (LOS) is a description of a driver's experience at an intersection or roadway based on the level of congestion (delay). Intersection and roadway conditions can range from LOS A, representing free-flow conditions with

little or no delay, to LOS F, representing saturated conditions with substantial delay. However, LOS is not a measure of safety or accident potential.

The roadways analyzed fall under multiple jurisdictions, including the City of San Jose, Santa Clara County, and Caltrans. Monterey Highway and portions of Bernal Road and Santa Teresa Boulevard are identified to be in the County's Congestion Management Plan (CMP). The CMP LOS standards take precedence for these roadway segments. A LOS D threshold, as noted above, is the preferred condition established in the County of Santa Clara Congestion Management Plan, but in no case should any roadway exceed an LOS E.

Tables 8.10-1 and Table 8.10-3 in the AFC summarize the existing and future LOS criteria and existing and future traffic volumes of the principal roadways in the project area. All local roadways are currently operating at LOS D or better. The intersection of Santa Teresa Boulevard with Bernal Road/Avenida Espana is projected to operate a LOS E, an acceptable level within the CMP.

Table 8.10-2 in the Application for Certification (AFC) provides the most recently available three-year (August 1995 through July 1998) accident history for State Highways (Caltrans 1998; San Jose Street and Traffic Department 1999). For roadway segments, accident rates are computed as the number of accidents per million vehicle-miles of travel (MVM). The MVM for selected roadways in the vicinity of the MEC range from a low of 0.4 on Santa Teresa Boulevard at the Bernal Road/Avenida Espana to a high of 1.8 on Santa Teresa Boulevard at Bernal Road/South of Baliey Avenue. When compared to statewide averages for comparable facilities (Caltrans, 1998), Santa Teresa Boulevard experiences a higher than average accident rate in the project vicinity while all other roadways are below the statewide average for similar facilities.

STATE HIGHWAYS AND LOCAL ROADWAYS

The major north-south roads in the area of the project site are Monterey Road, Santa Teresa Boulevard, U. S. 101, and State Route (SR) 85. Blanchard Road is a private road and is proposed to connect to the MEC site just west of the UPRR right-of-way.

Monterey Road passes through San Jose to the north of the MEC site and continues south through Gilroy. It runs parallel to, and between, the UPRR and U. S. 101. Monterey Road is classified as a four-lane divided arterial by the City of San Jose and as an Arterial Primary Urban (APU) by Santa Clara County for the portion that is in the County's jurisdiction. The road has 12 to 13-foot wide lanes, 6-foot paved shoulders, and left-turn lanes. The posted speed limit along Monterey Road is 50 miles per hour (mph). Average Daily Traffic (ADT) on Monterey Road is 22,575 vehicles, and the roadway operates at LOS C.

Santa Teresa Boulevard extends from San Jose to the north past the MEC site for a distance of approximately 2 miles where it becomes Hale Avenue. It is located to the west of the MEC site, and connects to Bernal Road approximately one and one half miles north, providing access to U. S. 101. Santa Teresa Boulevard is classified

as a minor arterial with two to four lanes within San Jose, and as APU by Santa Clara County over their portion south of the site. Santa Teresa Boulevard has 12 to 14-foot wide lanes, left-turn pockets, a 48-foot median, 9-foot paved shoulders, and striped and signed Class II bike lanes. The posted speed limit ranges from 45 to 50 mph. Average daily traffic ranges from 7,500 vehicles south of Bailey Avenue to 12,530 vehicles at Avenida Espana. The boulevard operates at LOS C and D in the two-lane portion, and LOS A in the four-lane portion.

Blanchard Road is a private road located about 3/4 mile south of Metcalf Road. There is a traffic light at the intersection. The proposed access road to the MEC site would connect to Blanchard Road just west of the UPRR.

U.S. 101, within Santa Clara County, crosses through eastern San Jose to the east, and connects with Interstates 880, 680 North, and 280 West. U.S. 101 is generally a 5 to 8-lane limited access freeway that narrows to 4 lanes north of Bernal Road (about 1 1/2 miles north of the MEC site) and continues about 6 1/2 miles south before it widens to 6 lanes. The posted speed limit on U.S. 101 is 65 mph. Average Daily Traffic is 77,770 north of Bernal Road, and 86,860 at the Bernal Road/Cochrane Road ramps. U.S. 101 operates at LOS C north of Bernal Road and LOS D near the Bernal Road/Cochrane Road ramps.

State Route 85, (West Valley Freeway), intersects U.S. 101 in the vicinity of Bernal Road. From this location, it extends west and then north to serve the western part of Santa Clara Valley. SR 85 is classified as a 4-lane freeway and includes two high-occupancy vehicle lanes. The posted speed limit is 65 mph. Average Daily Traffic is 28,280 at the U.S. 101/Bernal Road ramp and 43,935 west of Bernal Road. U.S. 101 operates at LOS B at the U.S. 101/Bernal Road ramp and LOS C west of Bernal Road.

The San Jose Streets and Transportation Department estimates citywide truck traffic to average 5 percent of total vehicular traffic.

PUBLIC TRANSPORTATION

The Santa Clara Valley Transportation Authority (VTA) provides regional and local public transportation service and connections to other transportation systems including bus service, light rail transit (LRT), Caltrain, and Bay Area Rapid Transit (BART).

The VTA operates an extensive network of local bus routes serving the urbanized portions of the county. These routes serve main arterial streets, neighborhoods/residential areas, shopping, schools, employment areas and other businesses. Approximately 80% of Santa Clara County residents are within a quarter mile of a transit route. Bus route 68 serves Santa Teresa Boulevard from downtown San Jose to Gilroy via the Blossom Hill Caltrain station and the Santa Teresa LRT station. Express bus 501 runs from Palo Alto to Bailey Road via the Santa Teresa LRT station.

Light rail service is provided 7 days a week, 24 hours a day. LRT vehicles operate every 10 minutes weekdays; every 15 minutes Saturdays and Sundays and holidays. The 34 LRT stations are served by numerous VTA bus routes, and 6,700 free parking spaces are provided at the 10 LRT stations in South San Jose. The current intra-county rail system consists of 21 miles of LRT, which extends from the Great America business area to the north, and to the Santa Teresa station in the south. The Santa Teresa station is located on SR 85 about 1 mile north of Bernal Road. It is the nearest LRT station to the MEC site.

Caltrain provides frequent train service between San Jose and San Francisco, including stops at Peninsula communities 7 days a week. Rail service is also provided between San Francisco and Gilroy using the UPRR tracks just west of Monterey Road. The Blossom Hill station, located on Monterey Road about 1.5 miles north of Bernal Road, is the Caltrain station closest to the project site. At its January 25, 2000 meeting, the County Board of Supervisors approved the Measure A Caltrain Improvement Plan. The approval paved the way for an increase to 86 trains per weekday between San Jose and San Francisco no later than 2006. The increase will be a joint effort with the VTA. In the area of the project site, approximately eight Caltrain commuter trains utilize the UPRR tracks per weekday.

From selected LRT stations (including the Santa Teresa station), VTA provides free shuttle service to and from work sites. VTA and BART provide paratransit services for passengers with special needs and disabilities.

Park-and-ride lots are provided throughout the area at LRT stations and are served by VTA buses. All Park-and-Ride lots can be used for carpool and vanpool passengers and most are served by Express Bus Routes. Many lots have special passenger amenities such as shelters, transit schedules, and bicycle lockers. The Park-and-Ride lots nearest to the MEC site are located at the Blossom Hill Caltrain station on Monterey Road and adjacent to the Santa Teresa LRT station on SR 85. There are future plans to extend LRT down Santa Teresa Boulevard.

The UPRR operates active main line tracks that pass along the east border of the MEC site. The UPRR tracks parallel the west side of Monterey Road and are used by Caltrain for passenger service and by UPRR for freight service. During weekday commuting hours, Caltrain serves the South County, including Gilroy, San Martin and Morgan Hill, on a fixed schedule.

IMPACTS

POWER PLANT

CONSTRUCTION PHASE

COMMUTE TRAFFIC

Construction of MEC will take approximately 18 to 20 months. It is anticipated that construction workers required to build MEC will be drawn from the local labor pool. The construction workforce will provide for a peak of approximately 400 construction workers over a 2-year period. This workforce includes approximately 328 for the power plant & electric transmission line and approximately 71 for the water and gas pipeline. MEC will require and use the services of local firms for major maintenance and overhauls, plant supplies, and other support services.

Table 8.10-4 in the AFC identifies the sustained peak number of trips generated by the MEC construction project. Approximately 280 truck trips per day (140 loads to the site) are expected over a 2-month period to import fill material; however, this activity will occur prior to peak construction on the site.

With a peak workforce of approximately 400, total daily vehicle trips will be 710 (including truck deliveries). Approximately 318 (including truck deliveries) of these trips will occur during the afternoon peak hour. Construction commute traffic during the morning was not addressed in the AFC due to the fact that construction workers will arrive prior to 7:00 a.m. U.S. 101, SR 85, Bernal Road, Santa Teresa Boulevard, Monterey Road, and Bailey Avenue are likely to be the primary roadways to access and egress the MEC site. Monterey Road and the proposed access road, or Santa Teresa Boulevard and the alternative access road, will experience the greatest volume of construction traffic. However, significant effects on the local transportation system are not expected from the construction activities at MEC for the following reasons:

- Noticeable impacts will be localized near the construction site due to the relatively small number of trips to be generated relative to the existing traffic levels. Table 8.10-5 shows projected current daily volume in 2002 and LOS on nearby roadways, and daily volumes and LOS under the worst case. The only segment that will experience a reduction in the LOS (with the proposed access road in place) is Monterey Road between Bernal Road and Bailey Avenue. The change from LOS C to LOS D still meets the CMP standard.
- Since the AFC addresses project impacts on roadway segments only, the Draft EIR for Coyote Valley Research Park (Cisco) was reviewed to determine the projected operation of intersections during the peak hours. Specifically, the "Background" condition was reviewed to determine the projected intersection operating conditions during the peak construction period for the MEC. The "Background" condition includes approved, but not yet built or occupied,

development projects in the vicinity of the MEC site. Under this condition, all nearby intersections are projected to operate at LOS D or better. Project traffic is not expected to significantly impact the morning peak hour intersection operations due to the fact that construction workers will arrive prior to 7:00 a.m. The AFC estimates that 318 trips (including truck deliveries) will occur during the afternoon peak hour. It is expected that U.S. 101, SR 85, Bernal Road, Santa Teresa Boulevard, Monterey Road, and Bailey Avenue are likely to be the primary roadways to access and regress the MEC site. None of the intersections along these routes are projected to operate worse than the CMP's LOS E standard; therefore, the assignment to MEC construction traffic to these intersections is not expected to cause a significant impact.

- The typical workday for construction workers begins at 7:00 a.m. and ends around 4:00 p.m. This limits the number of vehicles during peak hour traffic periods and thus helps reduce the potential traffic impacts.
- All vehicles will park off of public roadways in the staging and parking areas immediately south of the MEC site, although no specific location is given. Therefore, a parking and staging plan will be required to manage the on-site construction-period parking. Mitigation measures and conditions of certification that ensure this compliance are discussed later in this analysis.

Use of the alternative access road off Santa Teresa Boulevard will cause a portion of Santa Teresa Boulevard to function at LOS E during the afternoon peak hour, which is within the CMP standard. All other roadways would function at LOS D or better.

TRUCK TRAFFIC

The generation of truck traffic to the site will consist mainly of plant equipment deliveries, construction material deliveries, and import of fill material. The approximately 100,000 cubic yards of fill will be imported in a 2-month period, which will generate approximately 280 trips per day (140 loads to the site). Approximately 4,100 deliveries of equipment and construction materials are expected over the 18-20 month construction phase. These deliveries will average 10 per typical weekday and 25 per weekday during the peak month. The impacts associated with these delivery trucks (combined with construction worker trips) are included in the discussion of commute traffic above.

Due to the size, weight and additional truck traffic during construction of the Metcalf Project, this will contribute to additional wear on the local roads, subsequently increasing the need for regular roadway maintenance. Project-related roadway wear and tear is not considered significant and implementation of the construction traffic control plan (**TRANS-5**) and repairs to all roadways (**TRANS-6**) would address these roadway impacts.

Calpine/Bechtel is considering construction of a temporary rail spur from the existing UPRR tracks that run along the east side of the site for the shipment of heavy equipment. This would eliminate the need to transport heavy loads over city

streets. In case the temporary rail spur is not constructed, a workable alternative was identified in San Jose approximately 10 miles from the MEC site. This alternative is a rail siding at the Evergreen team track located adjacent to Senter Road near Phelan Avenue. Transport route arrangements would be required with Caltrans, the City of San Jose, and Santa Clara County for permitting and escort, as applicable.

The State Department of Motor Vehicles specifically licenses all drivers who carry hazardous materials. Drivers are required to carry a manifest, available for inspection by the California Highway Patrol inspection stations along major highways and interstates; and check for weight limits and conduct periodic brake inspections. Commercial truck operators handling hazardous materials are also required to take first aid instruction and procedures on handling hazardous waste spills.

Truck tank design for the anhydrous ammonia and other hazardous materials are federally mandated by Department of Transportation specifications, and are designed for impact safety. Staff has not addressed highway accident and traffic count levels on interstate and state highway systems because these roads are used continuously by commercial trucks and the traveling public.

As provided in the Laws, Ordinances, Regulations and Standards (LORS) section of this assessment, federal and state regulations are in place to ensure that the handling and transportation of hazardous materials on all roadways is done in a manner that protects public safety. Federal laws specific to this issue are Title 49, Code of Federal Regulations, Sections 350-399 and Appendices A-G, of the Federal Motor Carrier Safety Regulations. These sections address safety considerations for the transport of goods, materials, and substances over public highways.

The California Vehicle Code and the Streets and Highways Code (Sections 31600 through 34510) are important to ensure that the transportation and handling of hazardous materials are done in a manner that protects public safety. Enforcement of these statutes is under the jurisdiction of the California Highway Patrol. For an in-depth description of the amount and type of hazardous materials that will be used during operation of the facility, see the **Waste Management** and **Hazardous Materials** Sections of the FSA.

The **Hazardous Materials** Section of this document identifies Monterey Highway as the preferred route. Monterey Highway is compatible with the transport of hazardous materials because it has a median barrier (to limit possibility of head-on collisions), standard lane widths, minimal cross-streets, and paved shoulders. The three year (1995-1998) accident rate for Monterey Highway is lower than the statewide average for comparable facilities.

Some of the hazardous material generated at the site during plant operation will be transported for disposal at a Class I landfill or transported off site for recycling as described in the **Waste Management** Section of the FSA.

Potential impacts of the transportation of hazardous materials are mitigated to a level of insignificance by compliance with federal and state standards established to regulate the transportation of hazardous substances. Mitigation measures and conditions of certification that ensure compliance with state, federal and local permit and safety requirements are discussed later in this analysis.

Generally, only small quantities of hazardous materials will be used during the construction period. Section 8.12 of the AFC provides a description of these materials.

RAILWAYS

The issue of site distance for vehicles exiting the project site heading across the railroad tracks onto Monterey Road was raised as part of a data request. In the response, it was stated that the current alignment for the access road provides the maximum buffer space to the existing home on the Passantino property. A potential site distance problem occurs due to the elevation difference (approximately 4 feet) between the railroad tracks, the adjacent property and Monterey Road. In order to mitigate for this condition, Calpine/Bechtel is proposing a longer vertical transition along Blanchard Road approaching the railroad tracks to increase visibility and the installation of railroad crossing gates at the track crossing (See Attachments TT-191A and B for Data Request 191).

The railroad crossing for the access road to the MEC site is a private crossing of a roadway not maintained by a public authority; therefore, the railroad crossing is not required to have railroad grade crossing warning equipment (gates and signals). During the peak construction period, the MEC will generate approximately 25 truck deliveries per day, including some hazardous materials. The transportation and handling of hazardous substances associated with the MEC can increase roadway hazard potential at the railroad crossing. The handling and disposal of hazardous substances are addressed in other sections of this report. Potential impacts of the transportation of hazardous substances can be mitigated to insignificance by compliance with Federal and State standards established to regulate the transportation of hazardous substances. However, to ensure the safe transport of hazardous materials, railroad grade crossing warning equipment (gates and signals) should also be installed. Mitigation measures and conditions of certification that ensure this compliance are discussed later in this analysis.

OPERATIONAL PHASE

COMMUTE TRAFFIC

The operational phase of the MEC Power Plant will generate approximately 38 trips per day to the facility. These include 14 trips by employees and 5 trips by management and vendors. As mentioned previously, there will be approximately 20 full-time employees working at the plant. However, as a result of rotating shifts (8 a.m. to 8 p.m. and 8 p.m. to 8 a.m.), only 10 personnel will commute during the afternoon peak on any workday.

TRUCK TRAFFIC

During plant operations, trucks will periodically deliver and pickup replacement parts and various types of chemicals. Table 8.10.6 of the AFC shows the expected truck deliveries to the MEC site on a weekly and monthly basis. On average, there will be two truck deliveries to the project site per day. Hazardous substances can be mitigated to insignificance by compliance with Federal and State standards established to regulate the transportation of hazardous substances. Division 14.3 Section 32105 of the Vehicle Code specifies that every driver of a vehicle transporting inhalation hazards shall avoid driving into or through heavily populated areas, congested highways, or places where crowds are assembled. Transporters must get a Hazardous Material Transportation License from the California Highway Patrol (CHP) prior to moving the material. Mitigation measures and conditions of certification that ensure this compliance are discussed later in this report.

Table 8.10-7 of the AFC describes current and future afternoon peak hour volumes and LOS during the operation phase of the MEC project, including commute traffic from the site. The transportation effects associated with power plant operations will not be significant for the following reasons:

- Trips generated by non-plant personnel are expected to be minimal and would likely occur primarily during non-peak commute periods.
- Deliveries of hazardous materials will be limited and will be in compliance with all laws, ordinances, regulations and standards (LORS) governing hazardous materials.

EMERGENCY ACCESS

For new developments, the policy of the City of San Jose is to provide two points of access for emergency vehicles. The City is particularly concerned with Blanchard Road being the only point of access to the site, as it could be temporarily blocked by a train. Therefore, the City has requested that a second point of access be in place (that does not cross the railroad tracks) when the MEC becomes operational.

The MEC's ultimate circulation plan calls for a roadway connection from the site to the planned Coyote Valley Street System (which would connect to Santa Teresa Boulevard). However, the time frame for constructing the Coyote Valley Street System is unknown and not controlled by Calpine/Bechtel.

A condition of certification is provided that calls for the project to advance the construction of a portion of the Coyote Valley Street System if it is not constructed by others in a timely manner.

LINEAR FACILITIES

Construction of the transmission lines is not expected to occur within the public right-of-way and is not expected to cause any traffic impacts.

Construction of the recycled water and industrial wastewater pipelines proposed in the AFC will cross 23 streets between the point-of-connection and the MEC site. These streets are identified under 8.10.2.2.2 of the AFC.

Construction of the domestic water pipeline would cross Emado Avenue, a gravel road. Modification of the Snell Avenue/Santa Teresa Boulevard recycled water supply route so that it conforms with SBWR's latest design (Metcalf Energy Center (99-AFC-3) Supplement A), will not result in any adverse impacts along the proposed route. In comparison with the Snell Avenue/Santa Teresa Boulevard route, the SBWR route is the same length and reduces use of the major local streets (which have heavy traffic flow, thicker roadway pavement sections, and crowded utility crossings).

The natural gas pipeline's proposed route would cross U.S. 101, Monterey Road, UPRR, and Blanchard Road.

The construction of the underground recycled water, domestic water pipeline and industrial wastewater pipelines could increase congestion for all roadways in which trenching is required within the established right-of-way. However, such impacts will be short-term. Most of these crossings will be trenched and through access will be provided at all times. Traffic will be either directed along one-half of the roadway or routed across temporary trench bridging. Access for emergency vehicles will be maintained during construction. Typically plating of roadways will be used to ensure emergency vehicle access and maintain reasonable levels of traffic flow. Use of typical signals, signs, or warnings will notify motorists of construction activity. Any exceptional need for traffic control and signing for this area will be addressed in the construction traffic control plan as specified in the proposed conditions of certification. In all cases, construction within the public right-of-way will need to comply with Caltrans' "Manual of Traffic Controls for Construction and Maintenance of Work Zones" (Caltrans 1996).

The construction of the natural gas pipeline could increase congestion for all roadways in which trenching is required within the established right-of-way. Any exceptional needs for traffic control and signing for this area will be addressed in the construction traffic control plan as specified in the proposed conditions of certification. In all cases, construction within the public right-of-way will need to comply with Caltrans' "Manual of Traffic Controls for Construction and Maintenance of Work Zones" (Caltrans 1996).

All road crossing construction activities will be in accordance with local, state, and federal regulatory requirements and specification. Adequate barricades and lights will be provided around excavations at crossings in accordance with Caltrans' "Manual of Traffic Controls for Construction and Maintenance of Work Zones" and California Vehicle Code Section 21400. The use of the UPRR grade crossing at Blanchard Road will be in accordance with UPRR and California Public Utilities Commission (CPUC) requirements.

If either natural gas or water supply facilities are being constructed within or adjacent to a public roadway, then the traffic control plan should include provisions such that at least one lane of traffic flow is maintained in each direction or traffic flow is alternated by direction using flagmen. In addition, all pipeline construction should take place at night or on weekends to avoid traffic flow disruptions.

The operation of such facilities will not have an impact on area roadways except for short-term maintenance or unplanned difficulties. In either case, the impacts create traffic flow difficulties that are typically limited in duration and not significant.

CUMULATIVE IMPACTS

In consultation with the City of San Jose, staff has identified nine developments in various stages of approval or implementation throughout the south San Jose area in the vicinity of the MEC. They include: Coyote Valley Research Park (Cisco), the MEC Power Plant, a residential development located north of Metcalf Road and south of Basking Ridge Road, Hellyer Vista View I, Creekside Plaza, Lincoln Property Company Development, Stellex, Hellyer View, and Pepper Lane Development. These development projects are estimated to generate a total of 63,100 daily trips with 9,810 occurring during the morning peak hour and 8,980 occurring during the evening peak hour. In addition, there is expected to be a substantial amount of population growth in the City of San Jose and in Santa Clara County. This additional regional growth is expected to increase traffic two-percent per year on the regional roadway system for the next 20 years. Consequently, traffic volumes on the roadways in the vicinity of the MEC will likely significantly increase.

Construction of MEC will take approximately 18 to 20 months. The peak construction period is expected to occur during 2002. It is unlikely that the larger long-term projects, such as the Coyote Valley Research Park project, will be significantly built-out, since the projects are not yet approved. The construction phase analysis presented in this impact section provides the project impacts for this scenario.

The MEC's level of traffic generation will diminish between the construction and operational phases. Table 8.10-6 and 8.10-7 in the AFC indicates that the MEC is expected to add a total of approximately 38 daily vehicle trips during normal operations. Staff has estimated that the MEC is expected to add a total of four morning and four afternoon peak hour trips during normal operations. In addition, the MEC will add approximately four truck deliveries per week. The additional operational and maintenance trips generated by the MEC are not considered significant because they would account for less than one-tenth of one percent of the total added cumulative traffic of 63,100 daily trips.

Staff has also evaluated the MEC's impact on traffic conditions that would occur under a long-range cumulative condition that includes build-out of these and other projects, normally called a future growth condition in Santa Clara County. This condition also includes assumed improvements to the transportation network including the widening of U.S. 101 to six lanes, widening of Santa Teresa Boulevard, and other major roadway improvements. The Draft EIR for Coyote Valley Research Park and other traffic studies referenced at the end of this section were reviewed to determine the projected operation of intersections during the morning and afternoon peak hours. Specifically, the "Future Growth Condition" was reviewed to determine the projected intersection operating conditions during the

operation period for the MEC. Under this condition, all nearby intersections are projected to operate at LOS D or better, which meets the CMP LOS standard. As noted above, the MEC is expected to add a total of approximately 38 daily vehicle trips and a total of four morning and four afternoon peak hour trips during normal operations. The assignment of MEC construction traffic to these intersections is not expected to cause a significant impact during the "Future Growth Condition."

MITIGATION

The applicant has indicated its intention to comply with all LORS relating to the transport of oversized loads and the transport of hazardous materials. The applicant should also: 1) prepare a construction traffic control plan and implementation program, and 2) install grade crossing warning equipment (gates and signals) at the railroad crossing for the access road. In addition, the applicant will be committed to repairing roadways to original condition after construction is completed. The applicant should also manage the on-site construction-period parking. Staff has incorporated these measures into the proposed conditions of certification and is not requiring additional mitigation for traffic and transportation impacts.

COMPLIANCE WITH LORS

The applicant has stated its intention to comply with all federal, state, and local LORS. Conditions of Certification to ensure compliance are included below. Therefore, the project is considered consistent with identified federal, state, and local LORS.

During plant operation, trip reduction measures could be employed. But, since the maximum number of employees assigned to any one shift is 25 full-time employees, trip reduction measures for this project will have an insignificant effect.

FACILITY CLOSURE

The anticipated lifetime of the power plant is expected to be in excess of thirty years. At least twelve months prior to the proposed decommissioning, the applicant shall prepare a Decommissioning Plan for submission to the Energy Commission for review and action. At the time of closure all then-applicable LORS will be identified and the closure plan will address how these LORS will be complied with. The effects of project closure on traffic and transportation will be similar to those discussed for the project itself. Closure will create traffic levels that are similar in intensity and duration to those expected during facility construction. The removal of waste and other materials will produce impacts from truck traffic. At this time, no conclusions can be drawn on the effects of project closure on traffic and transportation.

CONCLUSIONS AND RECOMMENDATIONS

POWER PLANT

- During the construction phase, increased roadway demand resulting from the daily movement of workers and materials will increase congestion; however, significant effects on the local transportation system are not expected.
- During the operational phase, increased roadway demand resulting from the daily movement of workers and materials will be minimal.
- All transportation and handling of hazardous substances can be mitigated to insignificance by compliance with federal and state standards established to regulate the transportation of hazardous substances.
- Construction activities have the potential to damage local roadways. The applicant should be required to repair damaged roadways to their original condition.
- Construction workers will park on site.
- To ensure the safe transport of hazardous materials, railroad grade crossing warning equipment (gates and signals) should also be installed.
- The contribution of MEC construction or operational traffic to the cumulative impacts on local roadways and intersections will be less than significant.

LINEAR FACILITIES

Because their construction requires trenching within public road rights-of-way, the recycled and domestic water and industrial wastewater pipelines will impact both roadway function and levels of service. However, these impacts are expected to be short-term and not result in significant traffic and transportation impacts. The applicant will prepare a traffic control plan, which is required by the proposed Conditions for Certification. In addition, all development will take place in compliance with California Department of Transportation and City of San Jose limitations for encroachment into public rights-of-way. All pipeline construction should take place at night or on weekends to avoid traffic flow disruptions.

CONDITIONS OF CERTIFICATION

TRANS-1 The project owner shall comply with California Department of Transportation (Caltrans) and Santa Clara County limitation on vehicle sizes and weights. In addition, the project owner or their contractor shall obtain necessary transportation permits from Caltrans and all relevant jurisdictions.

Verification: The project owner shall provide the number of any oversize and overweight transportation permits received during that reporting period in the Monthly Compliance Report. In addition, the project owner shall retain copies of

these permits and supporting documentation in its compliance file until the start of commercial operation and for at least six months from the date of issuance.

TRANS-2 The project owner or their contractor shall comply with California Department of Transportation (Caltrans) and Santa Clara County limitations for encroachment into public rights-of-way and shall obtain necessary encroachment permits from Caltrans and all relevant jurisdictions.

Verification: The project owner shall submit copies of any encroachment permits received during that reporting period in the Monthly Compliance Report. In addition, the project owner shall retain copies of these permits and supporting documentation in its compliance file for at least six months from the date of issuance.

TRANS-3 The project owner shall ensure that all federal and state regulations for the transport of hazardous materials are observed during both construction and operation of the facility.

Verification: The project owner shall include, in their Monthly or Annual Compliance Reports, copies of all permits and licenses acquired by the project owner and/or subcontractors concerning the transport of hazardous substances.

TRANS-4 The project owner shall install railroad grade crossing warning equipment (gates and signals) at the railroad crossing for Blanchard Road in accordance with UPRR and local/federal agency design standards. If the warning equipment is not installed prior to the start of site preparation or earth moving activities, then the project owner shall install temporary measures, including the stationing of flag persons, to the satisfaction of the PUC and UPRR. These temporary measures shall stay in place until the permanent equipment is installed.

Protocol: If the permanent crossing warning equipment is not expected to be in place prior to initiation of site preparation or earth moving activities, then the project owner shall submit a traffic plan for the railroad crossing to UPRR and the Public Utilities Commission (PUC) for review and approval at least 60 days in advance of any site preparation or earth moving activities.

The project owner shall submit design plans for the grade crossing warning equipment (gates and signals) and plans for temporary measures to the UPRR and the Public Utilities Commission (PUC) for review and comment, and to the Energy Commission Compliance Project Manager (CPM) and PUC for approval.

Verification: The project owner shall inform UPRR, appropriate agencies and the CPM that the final grade crossing warning equipment (gates and signals) are ready for inspection.

TRANS-5 Prior to the start of site preparation or earth moving activities, the project owner shall consult with Santa Clara County, the City of San Jose,

and Caltrans and prepare a construction traffic control plan and implementation program addressing the following issues for linear facilities:

- timing of pipeline construction (take place at night or on weekends to avoid traffic flow disruptions);
- signing, lighting, and traffic control device placement;
- temporary travel lane closures;
- maintaining access to adjacent residential and commercial properties; and
- emergency access;

Prepare a construction traffic control plan and implementation program addressing the following issues for power plant construction:

- establishing construction work hours outside of the peak traffic periods;
- timing of heavy vehicle equipment and building materials deliveries; and
- off-street employee parking during construction.

Verification: At least 30 days prior to start of site preparation or earth moving activities, the project owner shall provide to Santa Clara County, City of San Jose and Caltrans for review and comment, and to the CPM for review and approval, a copy of their construction traffic control plan and implementation program.

TRANS-6 Following completion of construction of the power plant and all related facilities, the project owner shall repair roadways to original or as near original condition as possible.

Protocol: Prior to start of site preparation or earth moving activities, the project owner shall photograph, videotape, or digitally record images of Monterey Road between Metcalf Road and Blanchard Road and sections of public roadways that will be affected by water and wastewater pipeline construction. The project owner shall provide the CPM, Santa Clara County and Caltrans with a copy of these images. At least 60 days prior to start of site preparation or earth moving activities, the project owner shall also notify Caltrans about the schedule for project construction. The purpose of this notification is to postpone any planned roadway resurfacing and/or improvement projects until after the MEC construction has taken place and to coordinate construction related activities associated with other projects.

Verification: Within 30 days of the completion of project construction, the project owner will meet with the CPM, Santa Clara County, the City of San Jose and Caltrans to determine and receive approval for the actions necessary and a schedule to complete the repair of roadways to original or as near original condition as possible.

TRANS-7 Prior to start of site preparation or earth moving, the project owner shall prepare and submit a parking and staging plan for all phases of project construction to the City of San Jose and Santa Clara County for review and

comment and to the CPM for approval. During construction of the power plant and all related facilities, the project owner shall manage the on-site construction-period parking.

Verification: At least 60 days prior to start of site preparation or earth moving, the project owner shall submit the parking and staging plan to the City of San Jose and Santa Clara County for review and comment, and to the CPM for approval.

TRANS-8 Prior to the start of commercial operation of MEC, the project owner shall complete a two-lane secondary access connection. At that time, the Blanchard Road access will change to emergency use only.

Protocol: If the planned connection to Santa Teresa Boulevard has been completed as part of the Coyote Valley Street System, then the MEC project owner shall construct a connection to this system. If the off-site portion of the Santa Teresa Boulevard connection is not completed by others, then the City of San Jose can choose to obtain the right-of-way such that the project owner can design and construct the off-site portion with a credit against fees or future reimbursement. If the City is unable to provide this right-of-way, then the MEC may operate with a single point of access until such time as they are able to connect to the Coyote Valley Street System.

Approximately 12 months prior to the planned start of commercial operation, the project owner shall contact the City regarding the status of the off-site portion of the Santa Teresa Boulevard connection and inform the CPM.

Verification: At least 60 days prior to the start of commercial operation of the MEC, the project owner shall notify the City and CPM that the portion of the Santa Teresa Boulevard connection constructed by MEC is ready for inspection or that they intend to begin operations without the secondary access (due to absence of off-site portion).

RESPONSES TO PUBLIC AND AGENCY COMMENTS

SJ-10: A policy of the City of San Jose is to provide two points of access for emergency vehicles to new developments. The City is particularly concerned about Blanchard Road being the only point of access to the site, as it could be temporarily blocked by a train. Therefore, the City has requested that a second point of access be in place (that does not cross the railroad tracks) when the MEC becomes operational.

The MEC's ultimate circulation plan calls for a roadway connection from the site to the planned Coyote Valley Street System (which would connect to Santa Teresa Boulevard). However, the time frame for constructing the Coyote Valley Street System is unknown and uncontrolled by the MEC.

A condition of certification (TRANS-8) is provided that calls for the project to advance the construction of a portion of the Coyote Valley Street System if it is not constructed by others in a timely manner.

REFERENCES

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- Calpine/Bechtel (Calpine Corporation and Bechtel Enterprises), 1999e, Supplement A Submitted to California Energy Commission on October 1, 1999.
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NOISE

Testimony of Alan Rosen

INTRODUCTION

The construction and operation of any power plant creates noise, which is also defined as unwanted sound. The character and loudness of this noise, the times of day or night during which it is produced, and the proximity of the facility to sensitive receptors combine to determine whether a proposed project can be constructed and operated to meet applicable noise control laws and ordinances, and whether it will exhibit significant adverse environmental noise impacts.

The purpose of this analysis is to identify noise impacts from the construction and operation of the Metcalf Energy Center (MEC) and to recommend conditions to ensure that the resulting noise impacts will comply with the applicable laws, ordinances, regulations and standards (LORS), and will not present a nuisance to the surrounding community.

Before certifying the MEC, the Energy Commission must find that the project:

5. will likely be constructed and operated in compliance with all applicable noise LORS; and
6. will present no significant adverse noise impacts, or none that cannot be mitigated to the fullest extent possible.

This analysis is based, in part, on information provided in the Application for Certification (AFC) (Calpine/Bechtel 1999a), supplemental filing (Calpine/Bechtel 2000a), site visits, workshops, staff data requests and applicant responses, and discussions with other agency representatives.

COMMON UNITS OF MEASURE

For a description of the terms used to describe noise and methods to measure and evaluate noise, please see “**Noise: Appendix A**” and Section 8.5.1 of the AFC. The following is a comparison of the statistical parameters used in the LORS, mainly the L_{eq} , L_{50} and DNL, such that a meaningful comparison between the three can be made.

The L_{eq} is the average A-Weighted noise level during a specified measurement period (for example, 15-minute or hourly). The L_{50} is the A-Weighted noise level that is exceeded during 50 percent of the measurement period (i.e., 30 minutes during an hourly measurement). For a constant noise source, such as a power plant operating in normal mode, the L_{50} and L_{eq} are essentially equivalent.

The DNL (which is also referred to as: L_{dn} , or Day-Night Average Sound Level) is the A-weighted noise level during a 24-hour day calculated after addition of 10 dB to noise levels between 10:00 p.m. to 7:00 a.m. For a constant and continuous noise source, the DNL is 6 dB higher than the source level. For example, a 49 dBA

constant source level over a 24-hour period will have a DNL of 55 dBA (49 dBA + 6 dBA).

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

FEDERAL

Under the Occupational Safety and Health Act of 1970 (29 USC § 651 et seq.), the Department of Labor, Occupational Safety and Health Administration (OSHA) has adopted regulations (29 CFR § 1910.95) that establish maximum noise levels to which workers at a facility may be exposed. These OSHA noise regulations are designed to protect workers against the effects of noise exposure, and list permissible noise level exposure as a function of the amount of time during which the worker is exposed. (Please see **NOISE: Appendix A, Table A4** immediately following this section.) OSHA regulations also dictate hearing conservation program requirements and workplace noise monitoring requirements. The administering agency for the above authority is the Federal Occupational Safety and Health Administration (Fed-OSHA).

The Noise Control Act of 1972 (42 USC 6 4901 et seq., 40 CFR Parts 201-211) sets performance standards for noise emissions from “major sources.” The U. S. Environmental Protection Agency (USEPA) has identified a day/night level (L_{dn}) of 55 dBA¹ as providing reasonable protection against community annoyance and activity interference due to noise. USEPA administers the Noise Control Act.

STATE

There are no state regulations governing off-site (community) noise. Rather, state planning law (Gov. Code, § 65300) requires that all counties and cities prepare and adopt a General Plan. Government Code section 65302(f) requires that a noise element be prepared as part of the General Plan. This element is to “address existing and foreseeable noise problems....” Other state laws, ordinances, regulations and standards (LORS) include the California Environmental Quality Act (CEQA) and the California Occupational Safety and Health Act (Cal-OSHA).

California Vehicle Code, sections 23130 and 23130.5, sets noise limits for highway vehicles. The California Highway Patrol and the Santa Clara County Sheriff’s Office administer the vehicle code.

CAL-OSHA

California Occupational Safety and Health Administration (Cal-OSHA) has promulgated Occupational Noise Exposure Regulations that set employee noise exposure limits.

¹ Please see **Noise: Appendix A**, immediately following this section, for the definition of dBA and other terms used throughout this report.

Cal-OSHA regulations (Cal. Code Regs., tit. 8, § 5095 et seq.) are the same as the federal OSHA criteria described above. The criteria are based on a worker's noise level exposure over a specific time period. Maximum permissible worker noise exposure levels to protect against damage to the workers' hearing have been established. The administering agency is Cal-OSHA.

CEQA

California Environmental Quality Act (CEQA) requires that significant environmental impacts be identified, and that such impacts be eliminated or mitigated to the extent feasible. The applicable CEQA Guidelines (Cal. Code Regs., tit. 14, §15000 et seq., Appendix G § XI) explain that a significant effect from noise may exist if a project would result in:

1. Exposure of persons to, or generation of, noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies.
2. Exposure of persons to, or generation of, excessive ground borne vibration or ground borne noise levels.
3. A substantial permanent increase in ambient noise levels in the project vicinity above levels existing without the project.
4. A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project.

LOCAL

The MEC is to be developed on land that is partly in the City of San Jose and partly in Santa Clara County. The portion of the property within Santa Clara County is within the urban service area of San Jose and is proposed for annexation (1999a, AFC § 5.4.4.4.4). The noise standards of Santa Clara County and San Jose are similar. Specifically, San Jose adopts a DNL of 55 dBA (continuous L_{eq} of 49 dBA) as its goal for long-term noise. Santa Clara adopts an L_{50} criterion of 50 dBA.

NOISE: Table 1 summarizes the LORS for the various entities.

NOISE: Table 1
A summary of LORS for various entities

Regulatory Agency	Ordinance/Standard	Interpreted Standard	Comments
City of San Jose	<p>The General Plan calls for commercial, industrial and other non-residential uses located adjacent to residential and public/quasi-public land uses to mitigate noise generation to meet the 55 DNL limit at adjacent sensitive receptors.</p> <p>However, the City has indicated that there is flexibility in applying this standard when the adjacent land uses are agricultural rather than residential.</p> <p>MEC will meet the City's indoor goal at the nearest residence.</p>	<p>Noise Element of City General Plan: Long-term noise goal of 55 DNL (49 dBA continuous) at adjacent sensitive receptors.</p> <p>Indoor goal of 45 DNL.</p>	<p>Current design parameters are not to exceed 49 dBA (55 DNL) at the nearest sensitive receptor (M1).</p> <p>Because the noise reduction afforded by any conventional home easily exceeds 10 dB, even when the windows are open, an exterior sound level of 55 DNL will automatically result in an acceptable interior sound level of 45 DNL or less.</p> <p>The actual noise standards that the City will require MEC to meet will be developed during the Planned Development Zoning Permit phase.</p>
County of Santa Clara	<p>Noise Ordinance (Sec. B11 192(l)(d)) states that "If the noise measurement occurs on a property adjacent to a different land use category, the noise level limit applicable to the lower land use category, plus five (5) dB, shall apply." Table B1 1-1 92 lists the 10:00 p.m. to 7:00 a.m. noise level for one- and two-family residential at 45 dBA.</p> <p><u>Noise Element Of General Plan:</u> Within urban service areas, noise levels have been inventoried in the noise elements of the cities' general plans and the County recognizes this city data for decision regarding all lands within urban service areas, incorporated and unincorporated." (pages 1-29).</p>	<p>Noise Ordinance: Applying the ordinance to a residential land use would require MEC to meet an L₅₀ criteria of 50 dBA (45 dBA + 5 dBA) at the property line of the land receiving the noise.</p> <p><u>General Plan:</u> According to the County's General Plan the "residential land use" standard does not apply. Furthermore it requires use of the City requirements.</p>	<p>MEC was designed not to exceed 49 dBA (L_{eq}) at the fence line of the closest residence. Therefore MEC will be designed to mitigate the impact to the closest residence.</p> <p>It should also be noted that MEC is located in the San Jose urban service area and has accepted annexation into the City of San Jose as a condition of its certification; therefore, although the County impacts are mitigated, City criteria will ultimately apply.</p>
North Coyote Valley Campus Industrial Area Master Development Plan	Facilities located within the campus industrial area, the development plan contains a guideline of "55 L _{eq} eight-hour peak". In addition, the guideline recommends the octave band noise levels.	55 dBA L _{eq}	The plant will be designed not to exceed 49 dBA (L _{eq}) at the fence line of the nearest residence. The resulting octave band at the residence will meet the development plan guidelines.
CEC/CEQA	<p>The plant should not increase noise levels by more than 5 dBA above existing measurements of any other applicable LORS.</p> <p>The existing nighttime background measurements resulted in an average nighttime (10:00 pm – 5:00 am) L₉₀ of 39 dBA on two consecutive nights.</p>	The allowable plant noise contribution is 44 dBA (39 + 5) at the nearest sensitive receptor.	<p>The plant will be designed not to exceed 49 dBA (L_{eq}) at the fence line of the nearest residence. The resulting octave band at the residence will meet the development plan guidelines.</p> <p>The plant will be designed to satisfy the additional 5 dBA (49–44 dBA) requirement by incorporating sound-rated windows and air conditioning into the nearby residential structures.</p>

SETTING

The site is located in the central portion of the Santa Clara Valley, approximately seven miles northeast of the town of Morgan Hill. The site is directly adjacent to the west side of Monterey Road, immediately east of Tulare Hill, between Metcalf Road to the north and Blanchard Road to the south. The nominal site elevation is 250 feet above mean sea level (MSL). The area around the project site can be characterized as mostly rural, with some nearby single family residences.

The nearest sensitive receptor, identified as location M1 in the AFC, is a single-family residence located approximately 1,150 feet, on the west side of Monterey Road. Since sensitive receptors are within a 1-mile radius of the project site, mitigation measures are likely to be required to minimize noise impacts to these sensitive receptors.

For additional information regarding the site, setting and other project features, please see the **Project Description** section.

AMBIENT NOISE SURVEY

The Energy Commission's power plant certification regulations require that noise measurements be made at noise-sensitive locations where there is a potential for an increase of 5 dBA or more over existing background noise levels during operation of a power plant.

The applicant performed noise level measurements for a period of 37 hours, beginning at 8:00 a.m. on March 15, 1999 and ending at 9:00 a.m. on March 17, 1999, at the nearest residential site west of Monterey Road, location M1. Noise level data was recorded in terms of hourly L_{eq} , L_{10} , and L_{90} . Several 10-minute measurements were taken at each of the remaining monitoring locations during the 37-hour monitoring period. These spot measurements were taken in terms of L_{eq} , L_{10} , L_{50} and L_{90} at each location. For all locations, data were collected during nighttime hours to gain a representative sample at times when background noise levels would be the lowest.

NOISE SURVEY RESULTS

Results of the 37-hour sound level monitoring are shown on **NOISE: Table 2** and results of the spot sound level monitoring are shown on **NOISE: Table 3** below. Noise level recorded at location M1 represents existing conditions at the nearest sensitive receptor to the site. The lowest hourly nighttime L_{90} occurred between 1:00 and 2:00 a.m. on March 15, 1999 at 37 dBA. Typical hourly nighttime L_{90} levels ranged from 37 dBA to 53 dBA. The average nighttime (10:00 p.m.-7:00 a.m.) L_{eq} , L_{10} and L_{90} were 57, 60 and 46 dBA respectively for March 16; and 55, 53 and 46 dBA, respectively for the night of March 17.

Noise levels recorded at locations M2 and M3 represent existing conditions at the closest residence east of Monterey Road and Encinal School, respectively. The

dominant noise sources at these locations tended to be vehicular traffic along Monterey Road.

NOISE: Table 2
Hourly Noise Level at M1, the Nearest Residence to the Site

Date	Hour Ending	DNL Time Period	L _{eq}	L ₁₀	L ₉₀
3/15/99	9:01 p.m.	Day	57	53	45
3/15/99	10:01 p.m.	Day	64	66	44
3/15/99	11:01 p.m.	Night	48	51	41
3/15/99	12:01 a.m.	Night	64	68	37
3/16/99	1:01 a.m.	Night	43	45	38
3/16/99	2:01 a.m.	Night	42	45	37
3/16/99	3:01 a.m.	Night	45	49	38
3/16/99	4:01 a.m.	Night	44	47	38
3/16/99	5:01 a.m.	Night	46	48	43
3/16/99	6:01 a.m.	Night	55	54	49
3/16/99	7:01 a.m.	Night	60	58	53
3/16/99	8:01 a.m.	Day	61	67	50
3/16/99	9:03 a.m.	Day	60	65	47
3/16/99	10:03 a.m.	Day	51	54	46
3/16/99	11:03 a.m.	Day	61	53	45
3/16/99	12:03 p.m.	Day	51	54	46
3/16/99	1:03 p.m.	Day	53	54	48
3/16/99	2:03 p.m.	Day	52	54	48
3/16/99	3:03 p.m.	Day	56	55	49
3/16/99	4:03 p.m.	Day	60	66	51
3/16/99	4:57 p.m.	Day	61	59	53
3/16/99	5:57 p.m.	Day	60	60	54
3/16/99	6:57 p.m.	Day	64	59	53
3/16/99	7:57 p.m.	Day	58	57	50
3/16/99	8:57 p.m.	Day	68	68	47
3/16/99	9:57 p.m.	Day	63	58	46
3/16/99	10:57 p.m.	Night	50	53	44
3/16/99	11:57 p.m.	Night	57	48	40
3/17/99	12:57 a.m.	Night	60	57	39
3/17/99	1:57 a.m.	Night	44	47	39
3/17/99	2:57 a.m.	Night	44	47	37
3/17/99	3:57 a.m.	Night	44	47	40
3/17/99	4:57 a.m.	Night	48	51	43
3/17/99	5:57 a.m.	Night	55	54	48
3/17/99	6:57 a.m.	Night	59	59	53
3/17/99	7:57 a.m.	Day	58	58	54
3/17/99	8:57 a.m.	Day	60	67	51

NOISE: Table 3
Measured Noise Levels at M2 and M3 (dBA)

Measured Noise at M2, Nearest Residence East of Monterey Road							
Date	Start	End	L_{eq}	L₁₀	L₅₀	L₉₀	Major Noise Source
3/15/99	9:50 p.m.	10:00 p.m.	66	67	65	52	Traffic
3/16/99	2:58 a.m.	3:08 a.m.	61	60	38	34	Traffic, owl, frogs
3/16/99	8:20 a.m.	8:30 a.m.	79	84	76	63	Traffic
3/16/99	4:24 p.m.	4:34 p.m.	76	81	72	64	Traffic
Measured Noise at M3, Encinal School							
Date	Start	End	L_{eq}	L₁₀	L₅₀	L₉₀	Major Noise Source
3/15/99	10:08 p.m.	10:18 p.m.	63	66	62	50	Traffic
3/16/99	2:30 p.m.	2:40 p.m.	54	53	42	37	Traffic
3/16/99	8:05 a.m.	8:15 a.m.	68	72	65	57	Traffic
3/16/99	4:10 p.m.	4:20 p.m.	66	70	65	58	Traffic

ANALYSIS

SIGNIFICANCE CRITERIA

Noise impacts are evaluated by comparing a project's noise with "absolute" noise level standards contained in the LORS as well as criteria that address the increase in noise caused by a project.

The most stringent "absolute" noise level limitation required by any of the applicable LORS is the controlling criterion in the design of the noise control features of the project. In this case, the County of Santa Clara Noise Ordinance (Sec. B11 192(l)(d)) states that, "If the noise measurement occurs on a property adjacent to a different land use category, the noise level limit applicable to the lower land use category, plus five (5) dB, shall apply." Table B1 1-1 92 lists the 10:00 p.m. to 7:00 a.m. noise level for one- and two-family residential at 45 dBA. Applying the ordinance to a residential land use would require MEC to meet an L₅₀ criteria of 50 dBA (45 dBA + 5 dBA) at the property line of the land receiving the noise. This is comparable to the City of San Jose's goal of a DNL of 55 dB (continuous L_{eq} of 49 dBA). Since the lands surrounding MEC will officially be annexed by the City, this analysis uses the City's criteria for assessing impact based on absolute noise level.

As discussed, the significance of a noise impact is also a function of the change or increase in noise levels over existing ambient noise levels at any noise-sensitive receptor. This type of impact must be addressed as per CEQA. Although CEQA does not specify a numerical increase criterion, a project related increase of 5 dBA or greater is considered potentially significant by Energy Commission staff.

NOISE IMPACTS ASSESSMENT

Noise will be produced at the powerplant site during the operation of the project, and at the power plant site and along the corridors for linear project features during the construction phase. This assessment includes impacts from both construction

and operation activities and their potential effects at the nearest sensitive receptors, and to power plant operations personnel. An essential part of this assessment is a comparison of expected noise levels with acceptable noise levels presented in applicable LORS, and with existing background levels at noise-sensitive receptors.

CONSTRUCTION

Power Plant: Typical construction noise levels generated by equipment at the project site are given in **NOISE: Table 4** below. The equipment type, equipment source level range, the maximum expected equipment to be used, and the worst-case cumulative effects (i.e., all equipment on at once and in one stationary location) are provided.

Major construction phases consist of site clearing and preparation, grading, foundation construction, building and equipment construction, site clean up and facility start-up. Noise emissions will vary with each phase of construction.

NOISE: Table 4
Construction Equipment and Composite Site Noise Levels

Construction Phase	Construction Equipment	Equipment Noise Level (dBA)	Composite Site Noise Level @ 50 ft. (dBA)
Excavation	Pile driver	104	89
	Dump truck	91	
	Rock drill	98	
Concrete pour	Truck	91	78
	Concrete mixer	85	
Steel erection	Derrick crane	88	87
	Jack hammer	88	
Mechanical	Derrick crane	88	87
	Pneumatic tools	86	
Clean-up	Truck Steam blow (unmuffled)	91 130 @ 100'	120

Source: EPA, 1971 and Barnes, 1976.

Steam Blows: Typically, the steam blows create the loudest noise, inherent in the construction of all projects incorporating a steam turbine. After erection and assembly of the feedwater and steam systems, the piping and tubing that comprises the steam path will have accumulated dirt, rust, scale, and construction debris such as weld spatter, dropped welding rods, and the like. If the plant were started up without thoroughly cleaning out these systems, all this debris would find its way into the steam turbine, quickly destroying the machine.

In order to prevent this, before connecting the steam system to the turbine, the steam line is temporarily routed to the atmosphere. Steam is then raised in the HRSG or a temporary boiler and allowed to escape to the atmosphere through the steam piping. This flushing action, referred to as a steam blow, is quite effective at cleaning out the steam system piping. A series of short steam blows, lasting two or three minutes each, is performed several times daily over a period of two or three

weeks. The applicant anticipates performing the steam blow activities during the daytime hours for a period not to exceed 10 working days. At the end of this procedure, the steam line is connected to the steam turbine, which is then ready for operation.

Pile Driving: Pile driving noise depends on the method used and, in the case of conventional impact driving, the force of each blow. For average impacts of 20,000 ft-lb or more, the likely noise level at the nearest residence will be approximately 74 dBA. Such a level would be unacceptable and clearly disturbing. Weaker impacts ranging from 12,000 to 18,000 ft-lb would generally produce a level of about 63 dBA at M1 and would still constitute a legitimate disturbance. In order to minimize impact, the project construction hours will be limited (see **NOISE-7**).

LINEAR FACILITIES

- The plant switchyard will be connected to the PG&E transmission system via 240 feet of new 230-kV transmission line.
- Natural gas is conveyed to the power plant site via a new one-mile of 16-inch diameter supply pipeline. The pipeline will connect to an existing PG&E transmission backbone pipeline that runs along the eastern side of U.S. 101.
- A 20-inch, 7.3-mile pipeline will supply cooling water. The South Bay Water Recycling Program (SBWR) will supply the recycled water.
- Wastewater from the plant will be transported to San Jose's sewer system via a 12-inch pipeline. The recycled water and wastewater pipelines will be located in the same trench.
- Process make up water will be supplied from San Jose's municipal water system via a 1.25-mile pipeline.

Construction equipment for the linear facilities will travel along the route of these linear facilities; as such, the construction activities and associated noise will not impact any one location for an extended period.

COMMUNITY NOISE EXPOSURE (CONSTRUCTION)

Power Plant: Except for steam blow and pile driving activities, the anticipated construction noise emission levels and equipment usage for each phase of construction will result in noise levels at the nearest sensitive receptor that range from 46 to 49 dBA. These noise levels are anticipated to be faintly audible at the nearest residences and will not cause undue disturbances to local residents.

Steam Blows: Unsilenced steam blows (see **NOISE: Table 4** above) far exceed any noise level standards at both M1 and M2. The applicant proposes to use a temporary blowout silencer to reduce this noise level. Such a silencer has an overall noise reduction of 40 to 45 dBA and would reduce the estimated unsilenced level at M1 from 99 dBA to about 59 dBA. Since it is common practice to only carry out these steam blows during the day, silenced steam blows should produce no significant disturbance.

Alternatively, the applicant may employ a new, quieter steam blow process, variously referred to as QuietBlow[®] or Silentsteam[™]. This method uses lower

pressure steam over a continuous period of approximately 36 hours. Resulting noise levels reach only about 80 dBA at 100 feet, equivalent to 45 to 50 dBA at the nearest residence. This noise level complies with the City of San Jose noise guidelines. Staff proposes a notification process (see proposed Condition of Certification **NOISE-1** below) to make neighbors aware of impending steam blow activity.

Other: Noise generated during the testing and commissioning phase is not expected to be substantially different from that produced during normal full load operation. Starts and abrupt stops are more frequent during this period but overall it is usually short-lived. The steam releases associated with these starts and stops should not be problematic since they will be vented through permanent vent silencers.

WORKER NOISE EXPOSURE (CONSTRUCTION)

Power Plant and Linear Facilities: A reference distance of 50 feet was used in the AFC to evaluate on-site construction noise levels and their potential impacts on workers. The noise levels will vary significantly depending on whether a worker is closer to or conducting a noisy activity, but the L_{eq} levels are projected to average between 75 and 85 dBA during the first four phases of construction. Undoubtedly, some workers will occasionally be exposed to noise levels above 85² dBA during construction. The applicant predicts that construction noise levels will not reach levels that require worker hearing protection, but will put in place the use of engineering controls, administrative controls, and hearing protection devices.

To ensure that workers are adequately protected, staff has proposed a condition of certification (see proposed Condition of Certification **NOISE-3**).

COMMUNITY NOISE IMPACTS (OPERATION)

During its operating life, the project will represent essentially a steady, continuous and broadband noise source day and night. Occasional short-term increases in noise level will occur as steam relief valves open to vent pressure, or during startup or shutdown as the plant transitions to and from steady-state operation. At other times, such as when the plant is shut down for lack of dispatch or for maintenance, noise levels will decrease.

One possible source of noise annoyance would be strong tonal noises, individual sounds that, while not louder than the permissible levels, stand out in sound quality. To ensure the avoidance of such tonal sound, the noise control design of the MEC can be balanced to bring as many noise sources as possible to the same relative sound level, causing them all to blend without any one source standing out.

Another potentially annoying source of noise from a power plant is the intermittent or occasional actuation of steam relief valves. The hissing noise from these valves can be largely mitigated by the installation of adequate mufflers. To ensure that adequate measures are taken to mitigate tonal and intermittent noise sources, staff

² OSHA does not consider noise levels of 85 dBA or less hazardous to employee health.

has proposed measures (see proposed Condition of Certification **NOISE-4**) to ensure that tonal and intermittent steam relief noises are not allowed to cause a problem.

It is expected that startup and shutdown of the power plant will generally not produce any transient noise loud enough to be perceptible at any of the sensitive receptors. The applicant proposes that compressor air bleed lines will be lagged and/or routed into the exhaust system for noise attenuation by the exhaust silencer.

In order to comply with the City of San Jose Noise Element, the plant will be designed to maintain a noise level of 55 DNL or less during normal full load operation at the nearest residential receptor; or, equivalently, a maximum continuous noise level of 49 dBA.

From the noise survey results (see **NOISE: Table 2**) the lowest nighttime L_{90} noise level at the nearest sensitive receptors occurred between 1:00 and 2:00 a.m. on March 15, 1999 at 37 dBA. Typical hourly nighttime L_{90} levels ranged from 37 dBA to 53 dBA. These levels, however, were influenced by traffic noise from the nearby Monterey Highway, as evidenced by L_{10} values notably higher than background (L_{90}) levels. In such a case, it is appropriate to average the L_{90} values throughout the nighttime hours. The applicant has done this, calculating an average L_{90} value between 10:00 p.m. and 7:00 a.m. of 46 dBA (Calpine/Bechtel 1990a AFC § 8.5.3.4).

Staff disagrees in part with this approach. Between 5:00 and 7:00 a.m., the background noise level (L_{90}) is appreciably higher than other times of the night. For that reason, the noise levels between those hours were excluded from the nighttime averaging. With that exception, the average background nighttime noise levels were 39.5 dBA and 41 dBA on March 15 and 16, 1999 respectively.

The Energy Commission defines the area impacted by the proposed project as that area where there is a potential increase in existing noise levels of 5 dBA or more during operation of the project. Using an average nighttime noise level of 39 dBA, the project should be designed not to exceed a noise level of 44 dBA at the nearest sensitive receptor.

However, staff agrees with the applicant that achieving 44 dBA outdoors is not necessarily a reasonable goal and a more appropriate approach is to reduce noise levels at the receiver (through sound insulation of the homes) based on the following reasons:

- Relatively few sensitive receptors exist in the agriculturally-zoned area.
- The ambient background noise levels will only be exceeded during late nighttime/early morning hours
- Nighttime sleep would be affected more by louder single event noise from the train and truck traffic than from the steady-state noise of the MEC.
- The additional cost for mitigation at the source is \$5,000,000 and, given the few affected property owners, the additional cost is considered excessive.

- Mitigation at the receptors would provide a decrease in the current nighttime noise from individual loud train and vehicular passbys and reduce the impacts from future development, thus providing an overall benefit to the property owners that would not be received by mitigating noise at the source.
- The area is in the process of changing from a rural agricultural area to a more urban campus industrial area. Future development in the area would experience noise levels from the plant that are in conformance with the applicable noise standard of the City of San Jose (DNL of 55 dB).

WORKER NOISE IMPACTS (OPERATION)

Typically, individual power plant equipment can be provided that does not exceed a mitigated sound pressure level of 85 dBA at 3 feet from the equipment face and 5 feet above the ground. However, noise levels in some areas within a power plant typically exceed 85 dBA due to the additive effect of all nearby equipment as well as the effect of sound reflection and reverberation. Special noise control measures, such as silencers, acoustical enclosures, or insulation and acoustical lagging, may be considered to reduce in-plant noise levels.

These noise controls, however, are not always practical for reasons such as maintenance access, heat buildup, space limitations, and safety. Therefore, noise levels in some areas may exceed a sound pressure level of 85 dBA. OSHA and Cal-OSHA noise exposure limits would be satisfied using hearing protection within areas exceeding this level. Staff has proposed measures (see proposed Condition of Certification **NOISE-6**, below) to ensure compliance.

MITIGATION MEASURES

Unmitigated operation of the proposed facility would result in property line noise levels that would not meet local LORS. Accordingly, mitigation of essential noise generating equipment, inlet air silencers and HRSG mufflers will be considered. Mitigation in the form of structural enclosure of key power production equipment will be implemented. Primary areas targeted are turbine assemblies and synchronous generators.

Anticipated operation noise mitigation measures would also include the following, see **NOISE: Table 5** below:

NOISE: Table 5
Preliminary Noise Mitigation Measures for Plant Operation

Noise Source	Noise Control
Combustion Turbine Generator Enclosure	Limit noise through purchase specification to 85 dBA at 3 feet. Block noise with large barrier walls just south of turbine enclosures supported from pipe rack structure.
HRSGs	Specify low-noise design, possibly including an inlet duct noise barrier shroud. Improved shell casing. Stack silencers.
Steam Turbine Generator	Limit noise through purchase specification to 85 dBA at 3 feet. Block condenser, air ejector and condensate pump noise with a barrier wall just south of the unit. Acoustical lagging on steam lines and valves.
Boiler Feed Pumps	Enclose in acoustically treated buildings.
Cooling Tower	Specify very low noise design. Special low rpm fan blades. Possible wet and/or dry inlet silencing.
Duct Burner Control Skids	Limit noise through purchase specification to 85 dBA at 3 feet.
Gas Compressor Building	Probable masonry construction with silenced ventilation openings.
Pipe Rack Steam Lines	Apply acoustical lagging as required.

Normal start-up and shutdown: Steam venting during normal hot and cold starts can create significant noise if the vents are improperly silenced. To prevent transient noise from exceeding the steady-state design level at any of the residences near the plant, the main steam vents on top of each HRSG will be specified so as to limit venting noise to a value equal to the plant design level of 49 dBA at M1. This considerable noise reduction that is likely to occur from meeting the silencer noise specifications should substantially reduce the likelihood of any disturbance during plant start-ups.

Except under emergency circumstances, there is typically little or no additional noise created during normal plant shutdowns.

FACILITY CLOSURE

Upon closure of the facility, all operational noise will cease; no further adverse impacts from operation will be possible. The remaining potential noise source will be that caused by dismantling of the structures and equipment, and any site restoration work that may be performed. Since this noise will be similar to that caused by the original construction of the project, it can be treated similarly. That is, noisy work can be performed during daytime hours, with machinery and equipment properly equipped with mufflers. Any noise laws, ordinances, regulations and standards then in existence would apply; applicable Conditions of Certification included in the Energy Commission Decision would also apply unless properly modified.

CUMULATIVE IMPACTS

The cumulative impacts discussion for the MEC is based on CEQA and the CEQA Guidelines which require that the discussion of cumulative impacts be “guided by the standards of practicality and reasonableness” (Public Resources Code (PRC) §21083(b)); and that “the discussion include a list of past, present, and reasonably anticipated future projects producing related or cumulative impacts” (California Code of Regulations (CCR) §15130(b)(1)(A)). The CEQA Guidelines require that cumulative impacts are discussed when they are significant, and that the discussions of cumulative impacts reflect the severity of the impacts and their likelihood of occurrence. However, the Guidelines state that the cumulative impacts discussion need not be provided in as great detail as is provided for the proposed project.

Therefore, the purpose of this analysis is to:

1. Identify past, present, and reasonably foreseeable actions in the project area that could combine with noise at the MEC.
2. Determine if the impacts of the MEC and the other actions would overlap in time or geographic extent.
3. Determine if the impacts of the proposed project would interact with, or intensify, the impacts of the other actions.
4. Identify any potentially significant cumulative impacts.

Projects identified for consideration in this discussion of cumulative impacts include those where an application (1) has been submitted to local jurisdictions for required approvals and permits; and/or (2) that has been previously approved and may be implemented in the near future.

For this discussion of cumulative impacts, the general geographic area of influence is defined as an approximate 1-mile radius around the power plant, or within ½-mile of the linear facilities. The following projects fall under the above criteria.

1. Coyote Valley Research Park (Cisco)

The following information is from the Planned Development Rezoning Application and the Notice of Preparation (July 1999) and Draft Environmental Impact Report (EIR) (February 2000) for the project. The City of San Jose plans to act on this request during the summer and fall of 2000.

- Located on both sides of Santa Teresa Blvd., north of Bailey Ave. and south of Tulare Hill and Blanchard Rd.; northern end of the Cisco site is about 0.25 miles south of MEC.
- Cisco applied for a Planned Development Rezoning on 6/17/99. Proposed land uses are office, research and development, and light assembly facilities.

- 688 gross acre site; 6.6 million sq. ft. of building space on approx. 385 acres; building height up to 120 feet; the project will also include a 269-acre flood control basin and open space area, an electric power substation and other infrastructure improvements.
- Project will employ approximately 50,000 employees upon full buildout.

2. Coyote Valley Urban Reserve (CVUR)

In the City of San Jose's comment letter on the AFC (August 18, 1999), the City stated that the analysis of the MEC should address potential impacts on future development of the CVUR. The following summary information is from the City of San Jose 2020 General Plan.

- Located south of the North Coyote Valley Campus Industrial Area (NCVCIA); the majority of the CVUR is south of Bailey Ave., about 2 miles south of MEC, but a portion of the reserve extends northward (on the east side of Monterey Highway) about 0.5 miles south of MEC.
- Projected to contain as many as 20,000 to 25,000 housing units
- Development of area is long-term in nature. According to the current General Plan (adopted in 1994), urban development is expected outside the timeframe of the Plan (2020).
- Development of the area is dependent on prerequisite conditions, such as the addition of 5,000 new jobs in the NCVCIA.
- No residential development will be allowed in this area until a Specific Plan is prepared.

3. Residential Development

- Located north of Metcalf Rd. and south of the southerly terminus of Basking Ridge Road, and east of Hwy. 101; within 1 mile of MEC.
- 131 single-family detached units on an approx. 142 acre site (28 developable acres); applied for Planned Development Rezoning (9/1/99) from R-1:B-3 Residential District (single family, minimum 1-acre lots).
- Estimated population: 356
- Project requires preparation of an EIR, which has not been completed yet Buikema 1999, pers. comm.)

In order to determine the cumulative effect of development in the vicinity of the Metcalf Project, mechanical equipment and traffic noise generated by the Coyote Valley Research Park was added to noise from the Metcalf Energy Center. According to information provided by the applicant (Calpine/Bechtel 2000d), the increase in the DNL resulting from cumulative development would be less than 2 dB at the nearest noise-sensitive receiver (see **NOISE: Table 6**), below. Since a 5 dBA increase is required before an impact is identified, this cumulative noise impact would be considered less than significant.

NOISE: Table 6
Summary of Cumulative Impacts (DNL in dBA)

Scenario	MEC Only	CVRP Only	CVRP & MEC
Existing	63.3	63.3	63.3
Project Only	55.0	58.8	60.3
Existing plus Project	63.9	64.6	65.1
Increase in Existing DNL Resulting from Project(s)	0.6	1.3	1.8

RESPONSE TO PUBLIC AND AGENCY COMMENTS

A comment on the PSA (TM-2) questioned the potential for turbine noise to cause excessive vibration for mobile home owners within 1.5 miles of the plant. The plant's turbines are maintained in optimal balance to minimize excessive vibration that can cause damage or long term wear. Consequently, no excessive vibration would be experienced by adjacent land uses.

A recurring theme at the PSA workshops was a concern that Tulare Hill might act as an amphitheater to magnify the sound from the plant for many miles. The analysis of MEC noise assumes normal sound propagation and attenuation in the predicted noise levels. Since the project must comply with the applicable LORS and mitigation measures (see **NOISE-4**) outlined in this report, any effect of the topography would be taken into consideration since the project must comply with the LORS and mitigation requirements of the project.

CONCLUSIONS AND RECOMMENDATIONS

Staff concludes that if the MEC incorporates staff's proposed conditions of certification, the project will likely be built and operated to comply with all applicable noise laws, ordinances, regulations and standards. Staff further concludes that the MEC and cumulative growth will likely present no significant adverse noise impacts to the surrounding community.

Staff recommends the conditions of certification proposed below be included in the Commission Decision.

PROPOSED CONDITIONS OF CERTIFICATION

NOISE-1 At least 15 days prior to the start of construction (defined as start of rough grading) of the MEC, and again at least 15 days prior to the commencement of the steam blow activity, the project owner shall notify all residents within a 1-mile radius of the project site, by mail or other effective means. The project owner shall establish a telephone number for use by the public to report any undesirable noise conditions associated with the construction and operation of the MEC. If the telephone is not staffed 24 hours per day, the project owner shall include an automatic answering feature, with date and time stamp recording, to answer calls when the phone is unattended. This telephone number

shall also be posted at the MEC site during construction in a manner visible to passersby. This telephone number shall be maintained until the MEC has been operational for at least one year.

Verification: The project owner shall transmit to the Compliance Project Manager (CPM) in the first monthly construction report following the start of rough grading, a statement signed by the project manager attesting that the above notification has been performed, describing the method of that notification, and including a sample letter, poster or other notice, as appropriate. This statement shall also attest that the telephone number has been established and posted at the power plant site.

In the monthly construction report following the steam blow activity, the project owner shall transmit to the CPM a statement signed by the project manager attesting that, at least 15 days prior to the commencement of the steam blow activity, a notification was sent to all residents within a one-mile radius of the project. The report shall include a description of the method of that notification.

NOISE-2 Throughout the construction and operation of the MEC, the project owner shall document, investigate, evaluate, and attempt to resolve all project related noise complaints.

Protocol: The project owner shall:

1. use the Noise Complaint Resolution Form (see below for an example), or functionally equivalent procedure acceptable to the CPM, to document and respond to each noise complaint;
2. attempt to contact the person(s) making the noise complaint within 24 hours;
3. conduct an investigation to determine the source of noise related to the complaint;
4. take all feasible measures to reduce the noise at its source if the noise is project related, and
5. submit a report documenting the complaint and the actions taken. The report shall include a complaint summary and the results of noise reduction efforts; and if obtainable, a signed statement by the complainant, stating that the noise problem is resolved to complainant's satisfaction.

Verification: Within 30 days of receiving a noise complaint, the project owner shall file a copy of the Noise Complaint Resolution Form, or similar instrument approved by the CPM, with City of San Jose and with the CPM documenting the resolution of the complaint. If mitigation is required to resolve a complaint, and the

complaint is not resolved within a 30-day period, the project owner shall submit an updated Noise Complaint Resolution Form when the mitigation is finally implemented.

NOISE-3 Prior to the start of construction of MEC, the project owner shall submit to the CPM for review a noise control program. The noise control program shall be used to reduce employee exposure to high noise levels during construction and also to comply with applicable OSHA standards.

Verification: At least 30 days prior to the start of rough grading the project owner shall submit to the CPM the above referenced program. The project owner shall make the program available to OSHA upon request.

NOISE-4 If a traditional high-pressure steam blow process is employed, the project owner shall equip steam blow piping with a temporary silencer that quiets the noise of steam blows to no greater than 100 dBA measured at a distance of 100 feet. The project owner shall conduct steam blows only during the hours of 7:00 a.m. to 7:00 p.m. weekdays, and 8:00 a.m. to 6:00 p.m. weekends and holidays. If a modern, low-pressure continuous steam blow process is employed, the project owner shall submit a description of this process, with expected noise levels and projected hours of execution, to the CPM.

Verification: At least 15 days prior to the first high-pressure steam blow, the owner shall submit to the CPM drawings or other information describing the temporary steam blow silencer, and a description of the steam blow schedule. At least 15 days prior to the first low-pressure continuous steam blow, the project owner shall submit to the CPM drawings or other information describing the process, including the noise levels expected and the expected time schedule for execution of the process.

NOISE COMPLAINT RESOLUTION FORM

Metcalf Energy Center (99-AFC-3)		
NOISE COMPLAINT LOG NUMBER _____		
Complainant's name and address: Phone number: _____		
Date complaint received: _____ Time complaint received: _____		
Nature of noise complaint: 		
Definition of problem after investigation by plant personnel: Date complainant first contacted: _____		
Initial noise levels at 3 feet from noise source _____ dBA	Date: _____	
Initial noise levels at complainant's property: _____ dBA	Date: _____	
Final noise levels at 3 feet from noise source: _____ dBA	Date: _____	
Final noise levels at complainant's property: _____ dBA	Date: _____	
Description of corrective measures taken: Complainant's signature: _____ Date: _____		
Approximate installed cost of corrective measures: \$ _____ Date installation completed: _____ Date first letter sent to complainant: _____ (copy attached) Date final letter sent to complainant: _____ (copy attached)		
This information is certified to be correct: Plant Manager's Signature: _____		

(Attach additional pages and supporting documentation, as required).

NOISE-5 Upon the MEC first achieving a sustained output of 80 percent or greater of rated capacity, the project owner shall conduct a 25-hour community noise survey, utilizing the same monitoring sites employed in the pre-project ambient noise survey as a minimum. The survey shall also include the octave band pressure levels to ensure that no new pure-tone noise components have been introduced. No single piece of equipment shall be allowed to stand out as a dominant source of noise that draws legitimate complaints. Steam relief valves shall be adequately muffled to preclude noise that draws legitimate complaints.

The noise contributed by the MEC operation at the nearest residence shall not exceed 49 dBA L_{eq} under normal operating conditions including startups and shutdowns. If the results from the survey indicate that power plant noise levels are in excess of 49 dBA L_{eq} at the nearest residence, additional mitigation measures shall be implemented to reduce noise to a level of compliance with this limit. In addition, the project owner shall install sound-rated windows and air conditioning at all affected receptors exposed to noise levels between 44 dBA and 49 dBA L_{eq} .

Protocol: The measurement of power plant noise for purposes of demonstrating compliance with this Condition may alternatively be made at an acceptable location closer to the plant (e.g. 400 feet from the plant boundary) and this measured level then mathematically extrapolated to determine the plant noise contribution at the nearest sensitive receptor. However, notwithstanding the use of this alternative method for determining the noise level, the character of plant noise shall be evaluated at the nearest sensitive receptor to determine the presence of pure tones or other dominant sources of plant noise.

Verification: Within 30 days after completing the survey, the project owner shall submit a summary report of the survey to City of San Jose and the CPM. Included in the report will be the project owner's certification that the sound-rated windows and air conditioning have been installed in affected receptors, and a description of any additional mitigation measures necessary to achieve compliance with the above listed noise limits, and a schedule, subject to CPM approval, for implementing these measures. Within 30 days of completion of installation of these measures, the project owner shall submit to the CPM a summary report of a new noise survey, performed as described above and showing compliance with this condition.

NOISE-6 The project owner shall conduct an occupational noise survey to identify the noise hazardous areas in the facility. The survey shall be conducted within thirty (30) days after the facility is operating at an output of 80% of rated capacity or greater, and shall be conducted by a qualified person in accordance with the provisions of Title 8, California Code of Regulations sections 5095-5100 (Article 105) and Title 29, Code of Federal Regulations, Part 1910. The survey results shall be used to determine the magnitude of employee noise exposure. The project owner shall prepare a report of the survey results and, if

necessary, identify proposed mitigation measures that will be employed to comply with the applicable state and federal regulations.

Verification: Within 30 days after completing the survey, the project owner shall submit the noise survey report to the CPM. The project owner shall make the report available to OSHA upon request.

NOISE-7 Construction and construction related activity (that which causes off-site annoyance, as evidenced by the filing of a legitimate noise complaint) shall be restricted to the hours of: 7 a.m. to 7 p.m. on weekdays and from 8 a.m. to 6 p.m. on weekends and holidays.

Verification: The project owner shall transmit to the CPM in the first Monthly Construction Report a statement certifying that the above restrictions will be observed throughout the construction of the project.

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NOISE: APPENDIX A

FUNDAMENTAL CONCEPTS OF COMMUNITY NOISE

Noise levels can be measured in a number of ways. One common measurement, the equivalent sound level (L_{eq}), is the long-term A-weighted sound level that is equal to the level of a steady-state condition having the same energy as the time-varying noise, for a given situation and time period. (See NOISE: Table A1, below.) A day-night (L_{dn}) sound level measurement is similar to L_{eq} , but has a 10 dB weighting added to the night portion of the noise because noise during night time hours is considered more annoying than the same noise during the day.

NOISE: Table A1
Definition of Some Technical Terms Related to Noise

Terms	Definitions
Decibel, dB	A unit describing the amplitude of sound, equal to 20 times the logarithm to the base 10 of the ratio of the pressure of the sound measured to the reference pressure, which is 20 micropascals (20 micronewtons per square meter).
Frequency, Hz	The number of complete pressure fluctuations per second above and below atmospheric pressure.
A-Weighted Sound Level, dB	The sound pressure level in decibels as measured on a Sound Level Meter using the A-weighting filter network. The A-weighting filter de-emphasizes the very low and very high frequency components of the sound in a manner similar to the frequency response of the human ear and correlates well with subjective reactions to noise. All sound levels in this testimony are A-weighted.
L_{10} , L_{50} , & L_{90}	The A-weighted noise levels that are exceeded 10%, 50%, and 90% of the time, respectively, during the measurement period. L_{90} is generally taken as the background noise level.
Equivalent Noise Level L_{eq}	The energy average A-weighted noise level during the Noise Level measurement period.
Community Noise Equivalent Level, CNEL	The average A-weighted noise level during a 24-hour day, obtained after addition of 5 decibels to levels in the evening from 7 p.m. to 10 p.m. and after addition of 10 decibels to sound levels in the night between 10 p.m. and 7 a.m.
Day-Night Average Sound Level, DNL or L_{dn}	The Average A-Weighted noise level during a 24-hour day, obtained after addition of 10 decibels to levels measured in the night between 10 p.m. and 7 a.m.
Ambient Noise Level	The composite of noise from all sources, near and far. The normal or existing level of environmental noise at a given location.
Intrusive Noise	That noise that intrudes over and above the existing ambient noise at a given location. The relative intrusiveness of a sound depends upon its amplitude, duration, frequency, and time of occurrence and tonal or informational content as well as the prevailing ambient noise level.
Source: California Department of Health Services 1976.	

In order to help the reader understand the concept of noise in decibels (dBA), NOISE: Table A2 has been provided to illustrate common noises and their associated dBA levels.

NOISE: Table A2
Typical Environmental and Industry Sound Levels

Source and Given Distance from that Source	A-Weighted Sound Level in Decibels (dBA)	Environmental Noise	Subjectivity/ Impression
Civil Defense Siren (100')	140-130		Pain Threshold
Jet Takeoff (200')	120		
Very Loud Music	110	Rock Music Concert	Very Loud
Pile Driver (50')	100		Very Loud
Ambulance Siren (100')	90	Boiler Room	Very Loud
Freight Cars (50')	85		
Pneumatic Drill (50')	80	Printing Press Kitchen with Garbage Disposal Running	Loud
Freeway (100')	70		Moderately Loud
Vacuum Cleaner (100')	60	Data Processing Center Department Store/Office	
Light Traffic (100')	50	Private Business Office	Quiet
Large Transformer (200')	40		
Soft Whisper (5')	30	Quiet Bedroom	
	20	Recording Studio	
	10		Threshold of Hearing
Source: Peterson and Gross 1974			

SUBJECTIVE RESPONSE TO NOISE

The adverse effects of noise on people can be classified into three general categories:

- Subjective effects of annoyance, nuisance, dissatisfaction.
- Interference with activities such as speech, sleep, and learning.
- Physiological effects such as anxiety or hearing loss.

The sound levels associated with environmental noise, in almost every case, produce effects only in the first two categories. Workers in industrial plants can experience noise effects in the last category. There is no completely satisfactory way to measure the subjective effects of noise, or of the corresponding reactions of annoyance and dissatisfaction, primarily because of the wide variation in individual tolerance of noise.

One way to determine a person's subjective reaction to a new noise is to compare the level of the existing (background) noise, to which one has become accustomed, with the level of the new noise. In general, the more the level or the tonal variations of a new noise exceed the previously existing ambient noise level or tonal quality, the less acceptable the new noise will be, as judged by the exposed individual.

With regard to increases in A-weighted noise levels, knowledge of the following relationships (Kryter 1970) can be helpful in understanding the significance of human exposure to noise.

1. Except under special conditions, a change in sound level of one dB cannot be perceived.
2. Outside of the laboratory, a 3-dB change is considered a barely noticeable difference.
3. A change in level of at least five dB is required before any noticeable change in community response would be expected.
4. A 10-dB change is subjectively heard as an approximate doubling in loudness and almost always causes an adverse community response.

COMBINATION OF SOUND LEVELS

People perceive both the level and frequency of sound in a non-linear way. A doubling of sound energy (for instance, from two identical automobiles passing simultaneously) creates a three dB increase (i.e., the resultant sound level is the sound level from a single passing automobile plus three dB). The rules for decibel addition used in community noise prediction are:

**NOISE: Table A3
Addition of Decibel Values**

When two decibel values differ by:	Add the following amount to the larger value
0 to 1 dB	3 dB
2 to 3 dB	2 dB
4 to 9 dB	1 dB
10 dB or more	0
Figures in this table are accurate to ± 1 dB.	

Source: Thumann, Table 2.3

OSHA noise regulations are designed to protect workers against the effects of noise exposure, and list permissible noise level exposure as a function of the amount of time to which the worker is exposed:

NOISE: Table A4
OSHA Worker Noise Exposure Standards

Duration of Noise (Hrs/day)	A-Weighted Noise Level (dBA)
8.0	90
6.0	92
4.0	95
3.0	97
2.0	100
1.5	102
1.0	105
0.5	110
0.25	115

Source: OSHA Regulation

RELATIONSHIPS

$$L_{dn} = 10 \log (1/24)[15 \times 10^{(L_d/10)} + 9 \times 10^{(L_n+10)/10}]$$

Note: the 10-dB weighting added to the nighttime noise level. Daytime and nighttime are 15 hours (0700~2200 hrs) and 9 hours (2200~0700 hrs) respectively. L_d and L_n are the L_{eq} values over the 15 and 9 hours respectively. L_{dn} does not contain any consideration for tonal sounds, since it is derived from L_{eq} measurements.

CNEL is essentially the same as L_{dn} , except that different time segments are used in computation. The 24-hour period is divided into three segments instead of two. The day period (0700~1900 hours), evening (1900~2200 hours) and night (2200~0700 hours). The evening period is assigned 5-dB weighting and the nighttime is assigned 10-dB weighting. The extra 5 dB weighting during the evening results in higher values for CNEL than L_{dn} , but the difference is not statistically significant.

NOISE ATTENUATION

$$[L_p] \text{ (at } x = r) = [L_p] \text{ (at } r = y) - 20 \log(x/y).$$

Where: x = distance to point where noise level is to be determined.
 y = reference point.

$$\Delta_{Loss} = 20 \log (x/y).$$

Special case where $x = 2y$
 $\Delta_{Loss} = 20 \log (2y/y) = 20 \log (2) = 6$

\therefore As we double the distance, from a point source in free space, the noise level decreases by 6 dB.

VISUAL RESOURCES

Testimony of Joe Donaldson, ASLA

SUMMARY

Energy Commission staff analyzed both the potential visual impacts of the proposed project and the compliance of the project with applicable laws, ordinances, regulations, and standards. Staff concludes that the project has the potential to cause significant adverse visual impacts. Some of these significant adverse visual impacts would be mitigated to less than significant levels by implementation of mitigation measures identified in this analysis. Several other adverse visual impacts would be significant and unmitigable. Adverse visual impacts from construction activities, views from the Blanchard Road area (KOP 1), lighting, and visible plumes would be mitigable. The project has the potential to cause a significant and unmitigable adverse visual impact to views from KOP 1 and would degrade the general visual character and quality of the area. The proposed power plant project would contribute substantially to producing significant cumulative visual impacts in the North Coyote Valley. Also, the proposed project would conflict with several local policies regarding visual resources that are part of applicable laws, ordinances, regulations, and standards.

INTRODUCTION

The purpose of this analysis is to determine whether the proposed Metcalf Energy Center project would cause significant adverse visual impacts, including whether the project would be in conformance with applicable laws, ordinances, regulations, and standards pertaining to visual resources.

ORGANIZATION OF ANALYSIS

This analysis is organized as follows:

- describes staff's analysis methodology;
- describes applicable laws, ordinances, regulations and standards;
- assesses the visual setting of the proposed power plant site, including linear facility routes;
- evaluates the visual impacts of the proposed project on the existing setting;
- evaluates compliance of the project with applicable laws, ordinances, regulations, and standards; and
- recommends measures needed to mitigate any potential significant adverse visual impacts of the proposed project and to achieve compliance with applicable laws, ordinances, regulations, and standards.

METHODOLOGY

Staff's methodology for assessing visual impacts is described below and includes a description of the approach and process, the criteria, and the basis for the criteria used in evaluating the impacts of the proposed project.

APPROACH AND PROCESS

Visual resources are the natural and cultural features of the environment that can potentially be viewed. The evaluation of existing conditions of visual resources requires the application of a process that objectively identifies the visual features, or resources, of the landscape; assesses the character and quality of those resources relative to overall regional visual character; and identifies the importance to people (i.e., visual sensitivity) of views of visual resources in the landscape. With this preliminary establishment of the baseline (existing) condition, a proposed project or another change to the landscape can be systematically evaluated for its degree of impact. The degree of impact depends on both the magnitude of change to the visual resource (i.e., visual character and quality) and viewers' concerns for and responses to those changes. This general process is similar for all established federal procedures for visual assessment (Smardon et al. 1986 and represents a suitable methodology for visual assessment for other non-federal projects and areas.

The approach for this visual assessment is based on the Federal Highway Administration's (FHWA's) visual impact assessment system (Federal Highway Administration 1983) in combination with other established visual assessment systems. The visual impact assessment process for this project involves identification of the following:

- applicable laws, ordinances, regulations, and standards for protection of visual resources;
- visual resources and their visual character and quality in the region and around and at the project site, including linear facility routes;
- general visibility of the project area and site and important viewing locations (e.g., roads, residential areas, and public use areas);
- visual sensitivity based on viewer groups' concerns for visual resources (i.e., viewer sensitivity), the proximity of viewers to the project site, and other factors such as duration and frequency of views;
- significance criteria for visual impacts;
 - visual impacts of the proposed project and their levels of significance; and
 - mitigation measures that would reduce impacts to less-than-significant levels.

Data used in conducting this visual assessment were gathered from existing local government policy documents, documents prepared by the applicant for this project, and field visits to the project area and site. It should be noted that the analysis relies heavily on the data, including photographs, maps, and written information, provided by the applicant for this project.

CRITERIA FOR VISUAL ASSESSMENT

The visual character and quality of the region and the project site are evaluated using established FHWA criteria for visual landscape relationships. These criteria are vividness, intactness, and unity. They are defined as follows:

- Vividness is the visual power or memorability of landscape components as they combine in striking or distinctive visual patterns.
- Intactness is the visual integrity of the natural and human-built landscape and its freedom from encroaching elements; this factor can be present in well-kept urban and rural landscapes, as well as natural settings.
- Unity is the visual coherence and compositional harmony of the landscape considered as a whole; it frequently attests to the careful design of individual components in the artificial landscape. (Federal Highway Administration 1983.)

For this analysis, the appearance of the landscape is described using these criteria and the elements of form, line, color, and texture. These elements are the basic components, or attributes, of landscape character and are used to describe visual character and quality for most visual assessments (U.S. Forest Service 1974, U.S. Forest Service 1995, Federal Highway Administration 1983, Smardon et al. 1986).

Visual sensitivity is based on a combination of viewer sensitivity (i.e., the sensitivity of particular types of viewer groups based on their expectations and concerns for visual resources) and the visibility of resources in the landscape based on their proximity and elevational and directional position relative to viewers, the frequency and duration of views, and the number of viewers. Generally, visual sensitivity increases with higher viewer sensitivity, an increase in total numbers of viewers, higher frequency of viewing (e.g., daily or seasonally), and longer duration of views (i.e., how long a scene is viewed). For views by people with high viewer sensitivity, visual sensitivity is generally high for foreground views and moderately high for middleground views.

Viewer sensitivity is generally high for residents with views from in and around their homes; people who are traveling for pleasure; and people engaging in recreational activities (e.g., hiking, biking, picnicking, camping, boating, and fishing). In general, viewer sensitivity is high for people using recreation trails and areas, scenic highways, and scenic overlooks. Also, viewer sensitivity would be generally high for people working in a high quality work environment (e.g., the planned North Coyote Valley Campus Industrial Area). Viewer sensitivity tends to be lower for people driving as part of their work and can be lower for people traveling to and from work (U.S. Forest Service 1974, Federal Highway Administration 1983, U.S. Soil Conservation Service 1978).

The visibility of objects, visual resources, and other visual elements in the landscape is based in part on the position and speed of travel of viewers relative to the elements. Visual elements located more directly in front of traveling viewers (i.e., within their primary field of view or view cone) tend to be more noticeable and take on greater importance. The slower the speed of travel, the wider the traveler's

primary field of view often becomes. Fields of view for passengers tend to be broader than for drivers of vehicles. Also, the visibility of visual elements depends on the number of viewers and the frequency and duration of views.

Visibility is also based on the proximity of the elements to viewers. Generally, the closer an element is to the viewer, the more dominant it is and the greater is its importance to the viewer. A viewshed is an area of the landscape that is visible from a particular location (e.g., an overlook or residence) or series of points (e.g., a road, trail, or water body). To identify the importance of views of resources and other elements, a viewshed may be broken into distance zones of foreground, middleground, and background. Although distance zones in viewsheds may vary between different geographic regions or types of terrain, a commonly used set of criteria identifies the foreground distance zone as the area from the viewer to 1/4- to 1/2-mile from the viewer, the middleground zone as extending from the foreground zone to 3-5 miles from the viewer, and the background zone as extending from the middleground zone to infinity (U.S. Forest Service 1974). Also, visual resources and other elements that are higher in elevation than the viewer tend generally to take on greater visual importance than elements located lower than the viewer, especially when viewed from nearby (e. g., in the foreground distance zone).

Key observation points (KOPs) generally represent the most important or sensitive locations from which a proposed project or visual resource would likely be visible. KOPs are used in this analysis to provide examples of representative or typical views from general viewing areas and locations in and around the project area and are not the sole points from which views are analyzed. The combination of views of the proposed power plant from throughout the area is also analyzed. Data provided by the applicant includes photographs taken of the existing conditions of the project area and site from a variety of locations, including the KOPs identified for this project. The applicant has also provided photosimulations of the proposed project for most of the KOPs.

Criteria for determining the significance of visual impacts are based on the State CEQA Guidelines and specific interpretation of these guidelines by local government agencies. The specific criteria for determining significance of impacts for this project are identified in the "Impacts" section.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

FEDERAL AND STATE

The proposed project, including the linear facilities, is located on private and municipal lands and is not subject to federal or state land management requirements. Likewise, no roadway in the project vicinity is a designated or eligible State Scenic Highway. Therefore, the project is not subject to any federal or state regulations pertaining to visual resources.

LOCAL

The proposed power plant, including all of the linear features (i.e., water lines, natural gas lines, sewer lines, and above-ground power transmission lines), would be located in the City of San Jose and Santa Clara County. Therefore, the project will be subject to local laws, ordinances, regulations, and standards of the City of San Jose and Santa Clara County that pertain to protecting and maintaining visual character and quality and are from the *San Jose 2020 General Plan* (City of San Jose 1994b), *San Jose Zoning Ordinance* (City of San Jose 1997), *Master Development Plan and Guidelines for the North Coyote Valley Campus Industrial Area* (City of San Jose 1985), and *Santa Clara County General Plan* (Santa Clara County 1994). Applicable local laws, ordinances, regulations, and standards are identified in this chapter in the section entitled “Compliance with Laws, Ordinances, Regulations, and Standards.”

SETTING

This section identifies the existing, or baseline, conditions for the visual resources of the surrounding region and the project site and vicinity. Visual sensitivity, including viewer sensitivity and distance zones, is described for the region and project site and its surroundings. The existing visual character and quality of the region and views of the project site and surrounding areas are described using the FHWA visual impact assessment system. Visual quality of views is assessed using the criteria of vividness, intactness, and unity as applicable. Form, line, color, and texture are described where necessary to help further clarify the assessment of landscape character and quality. The character and quality of views are also based on visual resources identified in local plans as scarce or important to protect. For this analysis, these include views of open space, hills, and the rural landscape.

Because a large portion of the North Coyote Valley is intended to be developed in the foreseeable future, the visual character of the valley is likely to change under future conditions. Likely future conditions for visual sensitivity and visual character and quality are described to provide a contextual understanding of changes in the site’s surroundings that could affect visual conditions in the foreseeable future. As a point of clarification, this analysis considers the existing, or baseline, condition under CEQA to be the current condition of the valley at the time of starting preparation of this FSA. This baseline condition and likely future conditions are described in detail below and in Appendix 1.

VISUAL CHARACTER OF THE REGION

Describing the visual character of the region provides a context and frame of reference for identifying and assessing the visual quality of the site and its surroundings. The proposed project is located in the southern part of the City of San Jose and adjacent portions of unincorporated Santa Clara County. The proposed power plant, transmission lines, and gas line would be located in the northern part of Coyote Valley and the water and wastewater lines would be located in the southern Santa Clara Valley in the Edenvale area just north of Coyote Valley.

COYOTE VALLEY

Coyote Valley trends northwest to southeast and is bounded by steep rolling hills and high ridges that frame the generally flat valley. The Silver Creek Hills are to the northeast and the Santa Teresa Hills are to the southwest. The valley is about 2 miles wide and 7 miles long and extends from the City of Morgan Hill in the south to Tulare Hill and the Coyote Narrows in the north. Coyote Creek is the primary perennial stream draining the valley; it runs generally northwest along the northeast side of the valley near the base of the Silver Creek Hills. Fisher Creek, which runs north, drains the southwest portion of the valley and joins Coyote Creek at the Coyote Narrows at the northwest end of the valley near Tulare Hill.

The hills that frame the valley are mostly covered by annual grasslands that remain green throughout the winter and into mid-spring (see Visual Resources Figure 2), and turn golden-yellow in the summer and fall. Grazing of the hills generally maintains the grasses at low heights, creating a smooth appearance to the hills through much of the year. Corridors of trees follow the numerous small drainages descending from the hills and patches of woodlands and chaparral on the hillslopes contrast strongly in color and texture with the grasslands stretched across the rolling topography. The more northerly and easterly slopes of the Santa Teresa Hills on the southwest side of the valley generally support the more dense and larger vegetation and woodlands. During the times of the day and year when the sun is low and shadows are long, the valley can be particularly scenic. The patchwork of variable colors and textures created by the topography, vegetation, shadows, and occasional fog or clouds result in a very scenic natural setting for the valley. Several power transmission lines running across portions of the hills somewhat reduce the intactness of views. However, views of the surrounding hills are generally of moderately high intactness, unity, and vividness.

The valley bottom itself is generally rural in character, consisting largely of agricultural fields and orchards punctuated by scattered rural residences, roads, and small businesses. The largely intact riparian woodland associated with Coyote Creek meanders along the northeast edge of the valley at the base of the Silver Creek Hills. Visually prominent linear elements in the valley include the South Valley Freeway (State Route 101), which runs along the eastern edge of the valley, and Monterey Road and the Southern Pacific rail line, which run parallel to each other on the valley floor west of Coyote Creek. Other notable cultural modifications in the valley include the Metcalf Substation at the north end of the valley; power transmission towers and lines, mostly noticeable at Tulare Hill and near the freeway along the base of the Silver Creek Hills; a golf course; and various buildings scattered or occasionally clustered along Monterey Road, including the rural community of Coyote. Recently built elements in the valley include the IBM facility, consisting of a complex of four- and five-story modern office buildings on the west side of the valley, and the upgraded portion of Santa Teresa Boulevard between Tulare Hill and Bailey Avenue.

The overall visual character of the valley is of a moderately to highly intact rural agricultural area framed by natural-appearing hills. The City of San Jose (1985) characterizes the North Coyote Valley as providing a spectacular setting with a rural

nature, pastoral setting, and agricultural heritage of orchard plantings. In recognition of its value, the City has given the north valley area a special designation of Campus Industrial with the intent of preserving its “present rural aspect” (City of San Jose 1985). The valley area is also considered an important gateway into the San Jose area from the south (City of San Jose 1999a, p. 15).

HIGHWAY 101 SCENIC DESIGNATION

The San Jose General Plan (1994b) designates Highway 101 through the Coyote Valley as a Landscaped Throughway and Rural Scenic Corridor, designations which recognize the value and sensitivity of the area’s visual quality. For the large numbers of northbound travelers on this major north-south route, this portion of the highway corridor and the Coyote Valley itself are “the major southern gateway” to San Jose, providing important first impressions of the area (City of San Jose 1999a, p. 15). The Rural Scenic Corridor designation is assigned to roads in rural and open space areas of significant scenic value and carries special policies for protecting the viewsheds of these roads. For corridors with this designation, the City’s General Plan identifies that permitted uses “should be limited to well landscaped campus industrial uses, single family residences, agriculture, parks, trails, and other open space uses in order to preserve the natural scenic resources.” (City of San Jose 1994b, p. 191) In addition, the plan indicates that “development along designated Rural Scenic Corridors should preserve significant views of the Valley and mountains, especially in, or adjacent to Coyote Valley, the Diablo Range, the Silver Creek Hills, the Santa Teresa Ridge, and the Santa Cruz Mountains” (City of San Jose 1994, p. 90). Also, the Santa Clara County General Plan (1994) recognizes the aesthetic importance of this area by designating Highway 101 as a scenic highway and identifying the importance of protecting its scenery from “land uses and other activities which would diminish its aesthetic beauty” and “assuring the scenic quality of the corridor.”

EDENVALE

The Edenvale area is located in the southern part of the Santa Clara Valley just northwest of the Coyote Valley and north of Tulare Hill. The area is surrounded by natural appearing hills. The Coyote Creek riparian corridor extends along the northeast edge of the valley near the base of the hills. The flat valley floor contains mostly low-density residential development and neighborhood commercial land uses. Its general character is that of a suburban neighborhood surrounded by scenic hills.

PLANNING CONTEXT

The visual character of the North Coyote Valley is currently predominantly rural and natural. However, both near- and long-term plans by the City of San Jose are for this area to transition to more intensive land uses. These land use changes would undoubtedly substantially alter the appearance of the area and change its visual character. Although these planned changes in land use are not part of the existing, or baseline, condition for the area, some of these intended changes are described below to provide a context for understanding the transition in visual character that is likely to occur in the North Coyote Valley in the near future. The planning goals and vision also provide the standard against which changes are to be evaluated

NORTH COYOTE VALLEY CAMPUS INDUSTRIAL AREA

Recognizing the North Coyote Valley's scenic value and sensitivity and its importance as a gateway to the San Jose area from the south, the City of San Jose has designated a special land use category that is intended to "allow development that preserves the present rural aspect of the area" (City of San Jose 1985, p. 4). In giving this area the special designation of Campus Industrial, the City has recognized that "the rural nature of the valley, its pastoral setting, and its agricultural heritage of orchard plantings define not only its character, but also the developmental standards needed to preserve that character and benefit from it" (City of San Jose 1985, p. 4).

The North Coyote Valley Campus Industrial Area Master Plan and Guidelines (City of San Jose 1985) provide a detailed description and guidelines for all site planning and design in this area. The master plan calls for the area to be developed as large parcels for single users with minimum building coverage, low intensity use, emphasized landscaping, and uniform high design quality. The stated objectives for the area are to "protect the land's inherent character while allowing major companies to consolidate on single, large parcels" (City of San Jose 1985, p. 6).

The master plan was amended in November 1999 to "reinforce the unique, high quality development expected" in the valley (City of San Jose 1999b). The amendments only affected certain standards in the Private Development Standards section of the plan, including reducing the minimum size of campuses from 30 acres to 10 acres, increasing the allowable height of buildings from 90 feet to 120 feet, and making other changes to clarify the private development standards for the North Coyote Valley Campus Industrial Area. The Master Development Plan portion of the master plan and guidelines continues to call for parcels to average 50 acres with a minimum of 25 acres, limit building coverage to 30 percent, landscape at least 35 percent of the site, set back buildings from roadways to allow views to surrounding hills, establish a "typically rural pattern of buildings clustered at the center of large sites", maintain stringent height limits (allowing buildings to have a maximum height of 90 feet) to "lessen disruption of views of the hillsides which form the Valley and establish its character", and other guidelines to "ensure the preservation of the natural form of the Valley" (City of San Jose 1985, p. 6). The plan states that each parcel must be "designed with the overall form of the valley in mind" (City of San Jose 1985, p. 6). It is anticipated that this area would eventually provide approximately 50,000 jobs.

The Master Development Plan for the area identifies major features of the plan to include new interchanges with Highway 101; arterial connectors between the highway and the campus industrial area site that cross over Monterey Road and the railroad line; a realigned and restored Fisher Creek corridor with trails, riparian and other native trees, and habitat improvements; and a landscaped parkway that would run adjacent to the creek corridor near the edge or through most of the campus industrial area. The guidelines for development of the area emphasize the importance of maintaining the area's rural character by various means including providing natural landscaping along roads and hillsides, orchard-like landscaping in and around parking areas, and tall trees to "punctuate the central building masses."

The stated intent of these design guidelines is to ensure that the architecture and vehicles will be “subordinate to the natural setting” of the Valley (City of San Jose 1985, p 11).

The plan further emphasizes a commitment to developing the area “in concert with” the Valley’s “pastoral beauty” and achieving “visual harmony and continuity” throughout the area. Private improvement guidelines for height limits identify that buildings shall not exceed 120 feet, or 95 feet for Public/Quasi-Public designation, and that for other structures height limits could be established in the context of project review where the height is intrinsic to the structure’s function and significant adverse effects on adjacent properties are avoided (City of San Jose 1999b). Also, the guidelines identify that the central building grouping should have the most lush and ornamental planting, creating a “skyline landscape” for each parcel. The master development plan for landscape and open space (City of San Jose 1985, p. 10) shows the majority of the proposed power plant site as a riparian area.

The master development plan for the North Coyote Valley is currently in the process of being updated. Retitled “Master Development Plan, North Coyote Valley Campus Industrial Area”, a “Draft Review Copy” of the plan identified as “Subject to Change”, dated February 4, 2000 (City of San Jose 2000b) is being circulated. Although the revised draft plan identifies a variety of changes to the current plan, it appears that the intent of the revised plan is similar to that of the current plan. The revised draft plan states that, “the development standards contained in this document are intended to establish the high environmental and building qualities essential to accomplish the City’s goals” (City of San Jose 2000b, p. 1). The revised draft plan further states that the general theme of development in the valley should be planned to “cluster buildings, minimize driveways, maximize pedestrian and bicycle linkages, orient to future transit, and create a unique campus industrial area with lush landscaping, distinctive view corridors, and sensitivity to other natural amenities” (City of San Jose 2000b, p. 1). In further clarifying the purpose of the plan, it states: “The unusually restrictive nature of these guidelines is deliberate. North Coyote Valley will attract and retain the major high technology users it is intended to accommodate only if there is a clearly established standard of excellence and a commitment to meet that standard” (City of San Jose 2000b, p. 1). The revised draft plan identifies that, “the rural nature of the valley, its pastoral setting and its agricultural heritage of orchard plantings define its existing character” and recognizes that the valley “provides a spectacular setting which makes high quality industrial development mandatory” and allows “development that preserves much of the natural features of the area” (City of San Jose 2000b, p. 5). The revised draft plan reinforces the concept that future development in the valley “should be sensitive to the area’s environmental features, such as hills, views, existing trees, and agricultural history” (City of San Jose 2000b, p. 7). Common themes for development emphasized throughout the revised draft plan include reinforcing the valley’s rural history and natural setting, developing in concert with the valley’s natural beauty, and achieving visual harmony and continuity throughout the area.

URBAN RESERVE AREA

The City of San Jose has identified areas of the Coyote Valley south of the industrial campus area and east of Monterey Road as an urban reserve that would be developed largely for residential and supporting commercial and business purposes. Development of this urban reserve area would be triggered by the start of development of the campus industrial area that would generate at least 5,000 new jobs. Development of the high-density urban reserve area would substantially increase the population of the North Coyote Valley and affect its rural character. Because of this, the design guidelines for the campus industrial area play a particularly important role in preserving the rural character of the valley.

DEVELOPMENT PROPOSAL

The City of San Jose is currently reviewing a draft environmental impact report (EIR) for a planned development rezoning for 688 acres of the North Coyote Valley Campus Industrial Area. Cisco Systems intends to begin development of a headquarters complex as part of the proposed Coyote Valley Research Park that would provide up to 20,000 jobs over a 10-year time frame. The development of this area would be required to adhere to the master plan and design guidelines for the campus industrial area and would include development of the major improvements (e.g., freeway interchanges, Fisher Creek restoration, parkway, and infrastructure) required in the plan. Development of this area would trigger the ability to begin development within the urban reserve area and could also lead to the eventual extension of the city's light rail system along Santa Teresa Boulevard. Plans for the first phase of development in the south central part of the Campus Industrial Area just north of Bailey Avenue includes buildings that maintain a consistent, unified architectural design character reminiscent of a high quality business commercial development or unified college campus. The visual character of this proposed development is not reminiscent of an industrial development.

VIEWER SENSITIVITY

Viewer groups that live, work, or travel in the area are varied. They include residents, workers, travelers, and recreationists. Area residents and people traveling through or recreating in and around the area generally have the highest concern for visual quality and are the most sensitive viewer groups. Recreationists in the area include a portion of the high volume of travelers using Highway 101 and Monterey Road; people traveling to and from local parks and recreation areas (e.g., Santa Teresa Park, Motorcycle Park, and Field Sports Park); and bicyclists, hikers, and others using the Coyote Creek County Parkchain. Highway 101 is heavily used by people traveling for pleasure with destinations such as the Monterey Bay area, the San Francisco Bay area, and the Central Coast area. Because of the high volume of recreationists and others traveling for pleasure, viewer sensitivity is generally high in the region. A number of rural residences with high viewer sensitivity are also scattered throughout the Coyote Valley area. Viewer sensitivity in the region is highest for views by residents from within and around their homes, travelers of major roads in the area that carry high volumes of traffic (e.g., Highway 101, Monterey Road, and potentially Santa Teresa Boulevard), and recreationists using trails, parks, and other recreation facilities. Visual sensitivity is highest where

viewer sensitivity is high and viewers are located within the foreground distance zone (i.e., within ½ mile) of a particular view.

Viewer sensitivity in the area would likely increase in the near future due to planned development that would increase both the number of residences in the Valley and the number of workers who would have a fairly high awareness of and concern for the visual quality of their surroundings. Although viewer sensitivity is often considered moderate to low for people engaged in work activities, viewer sensitivity for future workers in the Campus Industrial Area would be assumed to be moderately high based on the cohesive, highly-unified, high-quality design of the working environment proposed for the North Coyote Valley Campus Industrial Area and the resulting expectations of workers for a high visual quality working environment.

VISUAL CHARACTER OF THE SITE AND SURROUNDINGS

The existing character and quality of visual resources of the project site and vicinity, including areas of linear project features, are described below. Important views from surrounding areas from which the project features may be visible are described. These descriptions provide a basis for identifying changes to the existing visual character and quality of views of the project site and assessing the level of significance of any visual impacts that would be produced by the proposed project. In addition, where appropriate, potential views are described for likely future conditions that include development that is planned to occur in the reasonably foreseeable future.

The approximately 20-acre project facility site is located at the northern end of the Coyote Valley at the base and southeast of Tulare Hill. The main part of the site where the power plant would be located is about 16.5 acres. An additional 3-acre strip, about 150 feet wide and 900 feet long, extends south along the southwest side of the rail line. This linear strip would be the main entry and access to the site from Blanchard Road. An additional west access road, approximately 1,500 feet in length, is intended to extend from the MEC facility to Blanchard Road by running generally parallel to Fisher Creek. The facility site is just west of and within 100 feet of the Southern Pacific rail line, 200 feet of Monterey Road, and 2,000 feet of Highway 101. A construction laydown area of approximately 12 acres would occupy the open agricultural field just south of the project site and immediately north of residences along Blanchard Road during the construction period.

Fisher Creek runs along the west and north sides of the site at the base of Tulare Hill. Riparian vegetation, including valley oak, willow, and walnut, line the creek channel. An intact grove of trees containing mature, large (approximately 40- to 45-foot-tall), walnut trees and valley oaks splits the site, extending entirely across the central portion of the site from the creek to the rail line. The central grove of trees and other trees along Fisher Creek are visible throughout a large area of the northern Coyote Valley. Because of the scarcity of tall trees on the valley floor (City of San Jose 1985) southwest of the rail line, this central grove of trees is an important visual elements that provides visual interest and variety in the landscape.

The project site is generally flat. The portion of the site south of the central grove of trees is part of an open agricultural field that extends south to Blanchard Road and residences. The area north of the trees consists of grazed grasslands, scattered trees and shrubs, various dilapidated structures and mobile homes, small sheds, animal pens, junked vehicles, and scattered piles of building materials and debris. This northern portion of the site is generally screened from public views by trees and the railroad berm along its eastern edge.

Located in the vicinity of the project site are a variety of land uses and visual elements that, because of their proximity to the site, provide a context for visual character and quality. Six rural residences are situated south of and within a quarter of a mile of the project site. The Coyote Creek riparian corridor and bike trail run just north and east of Monterey Road within a few hundred feet of the site (see Visual Resources Figure 3). The riparian corridor contributes substantially to the natural character and vividness of the area.

Just beyond the riparian corridor, a little over a quarter mile east of the project site, is Coyote Ranch, a privately-operated recreation facility that includes an historic ranch house on county park land. This facility and several residences and buildings along Monterey Road southeast of the site contribute substantially to the historic rural character and scenic quality of the area.

The Metcalf Substation, containing an array of metal power poles, is located just beyond the riparian corridor about a quarter of a mile northeast of the site. Because of the high density of industrial elements that contrast substantially in form, line, color, and texture with their surroundings, this facility generally reduces the overall intactness, unity, and vividness of views of which it is a major part. Also, just to the north of the project site on the shoulder of Tulare Hill are several tall metal lattice power transmission towers. A common element found in rural open space lands in the region, these transmission towers reduce the intactness of views of Tulare Hill somewhat, but do not substantially detract from the openness and rural visual character of the surrounding area.

Other surrounding land uses that contribute to the rural visual character and quality of the project area include the small rural roads and agricultural and open space lands in the vicinity. Highway 101 to the east is a major linear element that detracts somewhat from the Valley's rural character, but provides high quality views of the area.

VIEWS OF THE PROJECT SITE

The project site is visible from a variety of locations in the area. The viewers, visual sensitivity, and visual quality associated with views of the project site from these locations are described in detail in Appendix Vis-1. The detailed description of views of the project site distinguishes the existing baseline conditions from likely future conditions that include planned development of the Campus Industrial Area in the North Coyote Valley. Describing conditions that are likely to occur in the foreseeable future is intended to provide a context for understanding the transition in visual character that is likely to occur in the North Coyote Valley in the near future.

and is not used as part of baseline conditions for assessing the significance of impacts under CEQA.

Likely future conditions in the North Coyote Valley are for high quality planned campus industrial and residential development that would increase visual sensitivity for views in and around the valley and change the visual character of the valley from rural and natural to more developed. Development is intended to be of a type and quality that is “sensitive to the area’s environmental features, such as hills, views, existing trees, and agricultural history” and “preserves much of the natural features of the area” (City of San Jose 2000b, p. 7). Visual sensitivity in the area would increase because of a large increase in numbers of viewers, both area residents and workers, who would have a fairly high awareness of and concern for the visual quality of their surroundings based on the intended “visual harmony and continuity throughout the Campus Industrial Area” (City of San Jose 2000b, p. 17).

The viewers, visual sensitivity, and visual quality associated with existing conditions for views of the project site from key locations are summarized in Table Vis-1 below. In addition, the viewers, visual sensitivity, and visual quality associated with likely future conditions for views of the project site from key locations are summarized in Table Vis-2 below. Appendix Vis-1 contains a detailed description of the existing and likely future conditions for the key views.

IMPACTS AND MITIGATION MEASURES

This section describes the visual elements of the proposed project; identifies the applicant’s proposed mitigation measures to reduce the visual impacts of the project; identifies the specific criteria used to evaluate the significance of any identified visual impacts resulting from implementation of the proposed project; describes changes to views of visual resources that would result from implementation of the proposed project; describes the level of significance of any identified impacts; and identifies mitigation measures that would reduce some significant impacts to less-than-significant levels.

PROJECT APPEARANCE

The proposed project consists of a variety of structures and forms that in combination or separately may cause it to be noticeable or visually prominent relative to its surroundings. The main elements of the power plant that would be noticeable and visually prominent include two 145-foot-high heat recovery steam generator (HRSG) stacks; two 95-foot-high HRSG screening structures; an array of steel top works above the screening structures extending up to 122 feet in height and consisting of horizontal boiler drums, crossover pipes, steel support framework, cylinder-shaped silencers, and boiler steam vents; a 10-cell cooling tower array with screening measuring 64 feet high, 56 feet wide, and 473 feet long; and two 72-foot-high H-frame pole structures with electric lines extending 200 feet to connect to an existing off-site transmission tower. The project includes other structures and buildings with heights up to 42 feet, entry and access roads, a parking area, a drainage retention area, fencing, landscaping, and a temporary 12-acre construction laydown and staging area. The project also includes underground pipelines for

Table Vis-1. Summary of Existing Conditions for Viewers, Visual Sensitivity, and Visual Quality for Views of the Project Site

KOP No.	Location	Viewers	Visual Sensitivity	Visual Quality
1	Blanchard Road Area	Residents in and around homes	High	Moderately high
2	Northbound Monterey Road, Railroad, Coyote, and Residences	People traveling by road and train for work, recreation, and leisure; customers, employees, and users of business establishments; local area residents traveling around the area; residents in and around homes	Moderately low to high	Moderate to moderately high
3	Future Overcrossing for Campus Industrial Area	No existing viewers	Not applicable	Moderately high
4	Santa Teresa Boulevard	People traveling to and from work; local area residents traveling around the area; people traveling for recreation and leisure	Moderate	Moderately high
5	Highway 101	Travelers on a scenic highway, including people traveling for recreation and leisure and to and from work	Moderately high to high	Moderately low to moderately high
6	Parkway Lakes	People using the facility for recreation and leisure	Moderately high	Moderate
7	Coyote Ranch and Coyote Creek Trails	People using the facility and trails for recreation and leisure; residents in and around a home	High	Moderately high
8	Southbound Monterey Road and Railroad	People traveling by road and train for work, recreation, and leisure; local area residents traveling around the area	Moderate	Moderately low to moderately high
9	Basking Ridge Area	Residents in and around homes	Moderately high	Moderate
10	Fisher Creek Corridor	No existing viewers	Not applicable	Low to moderately high
11	Coyote Valley Urban Reserve	Residents in and around homes	Moderately high	Moderately high

Table Vis-2. Summary of Likely Future Conditions for Viewers, Visual Sensitivity, and Visual Quality for Views of the Project Site

KOP No.	Location	Future Viewers	Future Visual Sensitivity	Future Visual Quality
1	Blanchard Road Area	Workers at the NCVClA; residents in and around homes	Moderately high to high	Moderately high
2	Northbound Monterey Road, Railroad, Coyote, and Residences	Workers traveling to and from work at the NCVClA and other locations by road and train; local area residents traveling around the area; people traveling for recreation and leisure; customers, employees, and users of commercial and business establishments; residents in and around homes	Moderately low to high	Moderate; moderately high
3	Future Overcrossing for Campus Industrial Area	Workers and visitors traveling to and from work at the NCVClA; people traveling for recreation and leisure	Moderately high to high	Moderately high
4	Santa Teresa Boulevard	Workers traveling to and from work at the NCVClA and other locations; local area residents traveling around the area; people traveling for recreation and leisure	Moderately high	Moderately high
5	Highway 101	Travelers on a scenic highway, including people traveling for recreation and leisure and workers traveling to and from work at the NCVClA and other locations	Moderately high to high	Moderately low to moderately high
6	Parkway Lakes	People using the facility for recreation and leisure	Moderately high	Moderate
7	Coyote Ranch and Coyote Creek Trails	People using the facility and trails for recreation and leisure; residents in and around home	High	Moderately high
8	Southbound Monterey Road and Railroad	Workers traveling to and from work at the NCVClA and other locations by road and train; people traveling by road and train for recreation and leisure; local area residents traveling around the area	Moderately high	Moderately low to moderately high
9	Basking Ridge Area	Residents in and around homes	Moderately high	Moderate
10	Fisher Creek Corridor	People, including area residents and workers at the NCVClA, using the trail for recreation and leisure	High	Low to moderately high
11	Coyote Valley Urban Reserve	Residents in and around homes; local area residents traveling around the area	Moderately high	Moderately high

natural gas, recycled water, domestic water, and industrial wastewater, and one above-ground gas-metering station located near Highway 101.

Other elements of the project that could create visual impacts include night lighting and water vapor plumes from exhaust stacks and cooling towers that would be visible under certain atmospheric conditions. These elements are described below in the assessment of views from various areas and in more detail in separate sections on lighting and water vapor plumes in the section "Project Specific Impacts."

The applicant has identified a variety of key design features for the proposed project that are intended to help it blend with its current and future surroundings. Much of this aesthetic treatment was developed in response to feedback from community members, nearby property owners, local elected officials and their staffs, CEC staff, and other responsible agencies' staffs. The applicant has stated that the primary concerns expressed regarding aesthetics of the proposed power plant included the addition of visible exhaust stacks to the area landscape and design compatibility with development that is planned to occur in the near future as part of the Campus Industrial Area. The key aesthetic design features of the proposed project that the applicant has proposed to address these concerns are summarized below.

KEY AESTHETIC DESIGN FEATURES

The applicant has developed design treatment for the power plant that is "intended to make the plant consistent with the design qualities of the office structures that are planned to be developed on the adjacent industrial campus lands and make the plant attractive in its own right" (Calpine/Bechtel 2000, p. 8.11-22). The applicant has stated that "the key element of the proposed design is the provision of screening to enclose the HRSG units" (Calpine/Bechtel 2000, p. 8.11-22).

The HRSG units would be enclosed by aesthetic screening on the east, south, west, and north sides to a height of 95 feet to help effectively screen views of the main portions of the HRSG units. The southern corners of the screening structures would be curved to give the structure a lighter, less bulky appearance. The screening is intended to simulate the appearance of modern office buildings in order to relate the power plant's design to the buildings proposed for the Campus Industrial Area. The screening would consist of alternating horizontal bands of light gray-taupe metal spandrel panels and tinted medium gray-taupe translucent fiberglass panels or stainless steel mesh to simulate windows. The finishes for the screening materials are intended to reduce reflectivity.

The HRSG stacks and top works would extend above the screening. The stacks, which would include protruding metal catwalk structures near their tops, would be textured with a grid pattern and painted medium gray-taupe. The top works would be painted light gray-taupe and would not be visually screened.

The cooling tower would have a parapet around the top that would partially screen views of the exhaust cones. This and other buildings and structures would use colors, finishes, and materials to match those of the screening described above. To

further help screen the facilities and help blend the power plant with its current and future (i.e., the campus industrial area development) surroundings, the applicant has proposed landscaping around much of the plant's exterior.

A row of black walnut trees would be planted along the west edge of Monterey Road to extend the effect produced by the heritage Keesling walnut trees both south and north of the area. Native oaks, elderberries, and daylilies would be planted in naturalistic patterns between the row of walnut trees and railroad right of way. An evergreen hedge of large shrubs (i.e., California wax myrtle) would line the west side of the eastern fenced boundary of the project site. This hedge is intended to help screen views of the facility from passing passenger trains. On the south side of the power plant site and near the southerly buildings, a triple row of coast redwoods would be planted along with small trees in orchard-like patterns. The small trees in orchard-like patterns would also extend along the entry road to the facility to just north of Blanchard Road. The west and north sides of the site would be planted with native riparian plants in naturalistic patterns along the creek corridor. Native riparian plants would consist of trees such as oaks, buckeye, cottonwood, and sycamore and shrubs such as toyon, coffeeberry, blackberry, and elderberry.

Additional elements intended to address aesthetic concerns and help the power plant become compatible with the campus industrial development are identified below in the applicant's proposed mitigation measures.

APPLICANT'S PROPOSED MITIGATION MEASURES

The applicant has identified mitigation measures as part of the proposed project to reduce the visual impacts of the project. These measures are identified below and are considered part of the proposed project for this analysis.

POWER PLANT MITIGATION MEASURES

The applicant has identified the following mitigation measures to be included in the project design to reduce the visual impacts of the proposed power plant.

Site planning and landscape design:

- Placement of the administration building and other smaller structures on the southern edge of the plant site with the intent of creating a transition in scale between the future campus industrial buildings to the south and the plant's taller features.
- Location of the cooling tower on the west side of the site where it would be partially screened by the HRSG screening structures and site landscaping as it matures.
- Placement of the switching station on the north side of the site where the electric bus and take-off structures would be less visible to the public.
- Placement of the screened HRSG units in an area where they would block views from the planned industrial campus to the south of existing transmission towers located at the eastern toe of Tulare Hill.

- Placement of landscaping along the south side of the site to screen the lower portions of the project's facilities and create a visual link with the landscape treatments that will be required on the adjacent campus industrial lands.
- Installation of landscaping along the western edge of Monterey Road that is intended to screen the project's lower portions in views from the road and the northern end of Coyote and improve the appearance of the road corridor.
- Placement of landscaping along the access road and eastern edge of the site that is intended to partially screen views of the project from passenger trains and reinforce the effect of landscape screening along Monterey Road.

Architectural design:

- Use of wall structures for the HRSG enclosures that will have alternating horizontal bands of surface materials, creating forms and patterns similar in appearance to proposed buildings for the industrial campus area to the south.
- Use of square designs for the HRSG stacks to reduce their industrial character and improve their compatibility with other existing and future structures in the area.
- Application of a network grid on the exterior of the HRSG stacks to create shadowing and texture.
- Minimization of the height of the cooling tower and use of a parapet to partially screen views of the cones.
- Use of flat, neutral colors on structures to create visual interest, blend the power plant with its surroundings, and help relate it to existing and future structures in the surrounding area.

Additional measures:

- Plume abatement of cooling towers.
- Use of non-reflective materials for fences and treatment or painting of fences to blend with the surrounding environment.
- Construction of signs using non-glare materials and paint treatments using colors that are unobtrusive.
- Minimizing lighting by limiting it to areas required for safety, and shielding lighting from public view to the extent possible. Timers and sensors will be used to minimize the time that lights are on.
- Direction and shielding of lighting to reduce light scatter and glare. Highly directional, low-pressure sodium vapor fixtures will be used.

The applicant has identified the following additional mitigation measures that are proposed to reduce or eliminate power plant impacts identified in this analysis:

- Further color studies to be conducted in consultation with the City of San Jose and the CEC to identify a color scheme for the plant structures that will

maximize their visual integration into their landscape backdrop and optimize their relationship to surrounding structures.

- Installation of trees along Coyote Ranch Road in consultation with the manager of Coyote Ranch to reduce the visibility of the project's structures from KOP 7.
- Collaboration with Caltrans to ensure good maintenance and continued growth of the existing trees planted along the west side of U.S. 101 in the vicinity of KOP 5.
- In the event that a trail is developed in the corridor along Fisher Creek, consultation with San Jose Park Department staff and staff of other relevant agencies to design and install plantings along the east edge of the trail that will screen views toward the plant site.
- In consultation with project site neighbors, the City of San Jose, and the CEC, design and installation of temporary fencing around the laydown area adjacent to the plant to reduce the visibility of construction-period activities.

TRANSMISSION LINE MITIGATION MEASURES

The applicant has identified the following mitigation measures to be included as part of the project design to reduce the visual impacts of the proposed transmission line facilities:

- The transmission structures will be finished with flat, neutral gray tones to help relate them to the colors of the structures in the existing transmission corridor and blend with their surroundings.
- Non-specular conductors and non-reflective and non-refractive insulators will be used to reduce conductor and insulator visibility.

PIPELINE MITIGATION MEASURES

The applicant has identified the following mitigation measure to be included as part of the project design to reduce the visual impacts of the proposed pipelines:

- After construction, ground surfaces will be restored to their original condition, and any vegetation that had been removed during the construction process will be replaced.

SIGNIFICANCE CRITERIA

Criteria for determining the significance of visual impacts are based on the direction from the California Environmental Quality Act (CEQA) and the CEQA Guidelines. The CEQA Guidelines define a "significant effect" on the environment to mean a "substantial, or potentially substantial, adverse change in any of the physical conditions within the area affected by the project, including...objects of historic or aesthetic significance". (Cal. Code Regs., tit.14, § 15382.) Appendix G of the CEQA Guidelines, under Aesthetics, lists the following four questions for lead agencies to address:

1. Would the project have a substantial adverse effect on a scenic vista?

2. Would the project substantially damage scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?
3. Would the project substantially degrade the existing visual character or quality of the site and its surroundings?
4. Would the project create a new source of substantial light or glare which would adversely affect day or nighttime views in the area?

In addition, Appendix G of the CEQA Guidelines, under the Land Use and Planning section, poses the question as to whether the project would conflict with any applicable land use plan, policy, or regulation (including, but not limited to a general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect. Applicable land use plans, policies, and regulations for this project are identified in the section "Compliance with Laws, Ordinances, Regulations, and Standards." Conflicts with such laws, ordinances, regulations, and standards as they relate to visual concerns could constitute significant visual impacts; these conflicts are also described in the section "Compliance with Laws, Ordinances, Regulations, and Standards." Also, CEQA requires the lead agency to address impacts that are individually limited but cumulatively significant.

The City of San Jose has identified that a visual impact would be considered significant if the project would:

- have a substantial, demonstrable negative aesthetic effect; or
- restrict or impair the view within a designated scenic corridor; or
- remove or substantially alter an important scenic or aesthetic resource; or
- substantially block existing views of scenic vistas or resources; or
- produce substantial new light or glare such that it poses a hazard or nuisance (City of San Jose 1999a).

Based on the CEQA Guidelines, consideration of the City of San Jose's significance criteria, and the application of professional standards and practices, significant impacts for this project would result from the following:

- conflict with any applicable policies, ordinances, or other regulations for visual resources identified in the general plans, zoning ordinances, or other adopted plans of the local governments in whose jurisdiction the project is located;
- substantial reduction in the visual character or quality of views identified to be of moderate visual quality to high visual quality and moderately high to high visual sensitivity; or
- creation of a new source of substantial light or glare in a location where it didn't exist before and which would adversely affect day or nighttime views with moderately high or high visual sensitivity.

Because a large portion of the North Coyote Valley is intended to be developed in the foreseeable future, the visual character of the valley is expected to change

under future conditions. As a point of clarification, this analysis considers the existing, or baseline, condition under CEQA to be the current condition of the valley at the time of starting preparation of this FSA as it is described in the Setting section of this Visual Resources chapter. Impacts are analyzed and the significance of those impacts are determined based on this existing condition. In addition, impacts are described based on likely future conditions that are expected to occur in the foreseeable future in order to provide a context for understanding the changes that are likely to occur and the proposed project's effects on this future condition. However, for any impacts that are identified for likely future conditions in this analysis, no determination of significance is provided.

PROJECT SPECIFIC IMPACTS

CONSTRUCTION IMPACTS

Construction of the project is expected to require up to 20 months. Construction activities, including use of a 12-acre construction laydown and staging area, would be temporary. Immediately following completion of their use, any construction staging areas would be removed and cleaned up. Any construction activities, including use of construction staging areas, that persist longer than one year would be of concern, especially if the visual sensitivity of views of these areas and activities is at least moderately high.

Visual impacts associated with construction of the power plant and use of the construction laydown and staging area would persist for more than one year and are of concern. Any visual impacts of the power plant during its construction are assumed to be similar to the impacts following its construction. Therefore, evaluation of the visual impacts of the power plant during its construction is not discussed further. Visual impacts of the construction laydown and staging area are evaluated below.

IMPACTS OF CONSTRUCTION LAYDOWN AND STAGING AREA

The 12-acre construction laydown and staging area would be located immediately south of the proposed power plant site, west of the railroad tracks and Monterey Road, east of Fisher Creek, and immediately north of residences on Blanchard Road. The laydown area would be visible in foreground views from the Blanchard Road residences and passing passenger trains and partially visible in foreground views from Monterey Road for both northbound and southbound travelers. Also, it would possibly be visible in foreground views from residences on the east side of Monterey Road. It would also be visible in the middleground from Santa Teresa Boulevard. With the possible exceptions (depending on timing of construction) of the future overcrossing for the campus industrial area and the Fisher Creek corridor trail, it appears that the laydown area would not be readily visible from other important viewing areas. Because the future overcrossing and trail are not expected to be built until after the power plant is built and the construction laydown area has been removed, it is assumed that there would be no visual impacts for these views.

Construction activities and use of the laydown area during the construction period would continue for at least 1 ½ years, which is substantially longer than the one-year period of concern identified above for temporary visual impacts. The laydown area would cover a large portion of the open agricultural field area south of the power plant site and north of the residences on Blanchard Road. The laydown area would be highly visible in foreground views from in and around the residences on Blanchard Road and from passing trains. The laydown area would be used for storage of construction materials, vehicles, and heavy equipment and for parking for workers. It would also contain temporary service buildings. It is assumed that the laydown area would also have lighting for security and safety. It is assumed that buildings, equipment, and stored materials could be 12 to 15 feet in height or higher. All of these elements would introduce new forms, textures, lines, colors, and potentially new light sources to views of the area. The visual impacts of the construction laydown and staging area are described below for the affected viewing locations.

Impacts to Views of the Laydown Area from the Blanchard Road Area

Views of the laydown area from the Blanchard Road area have high visual sensitivity and moderately high visual quality. Visual Resources Figure 4 shows an existing view from this area from KOP 1. The laydown area would cover a large portion of the open field area just past the corner of the wood fence and be highly visible in foreground views from in and around the residences. Use of the area for storage of materials, vehicles, and equipment would introduce new forms, textures, lines, and colors and potentially lighting that would substantially reduce the intactness, unity, vividness, and therefore visual quality of existing views of the open agricultural field and the area from moderately high to moderately low. For these reasons, visual impacts of the laydown area for views from Blanchard Road would be significant.

Impacts to Views of the Laydown Area from Monterey Road, Residences, and the Railroad

Views of the laydown area from Monterey Road and passing passenger trains on the railroad have moderate to moderately high visual sensitivity. For residences along the east side of Monterey Road, visual sensitivity is high. Visual Resources Figure 5 shows an existing view from KOP 2 by northbound travelers from Monterey Road. For northbound travelers on Monterey Road, the visual quality is moderate. Southbound travelers on Monterey Road would have more open and somewhat closer views of the laydown area and these views would be moderately high in visual quality for views from the portion of the road near the project site. Views of the laydown area for both northbound and southbound travelers on Monterey Road would be partially or intermittently screened by the railroad berm and vegetation. However, the upper portions of taller elements within the laydown area would be visible by both northbound and southbound travelers on Monterey Road.

For southbound travelers on Monterey Road, the existing views are of riparian trees, agricultural buildings, rural homes, and the Santa Teresa Hills in the middleground and background. Views from passing trains would also include open agricultural fields on and south of both the project site and laydown area. For

southerly views from this portion of Monterey Road and trains traveling just south of the central grove of trees on the project site, the visual quality is moderately high. The laydown area would cover much of the open field south of the power plant site and be visible in foreground views. Use of the area for storage of materials, vehicles, and equipment would introduce new forms, textures, lines, colors and potentially lighting that would substantially reduce the intactness, unity, and vividness of existing views of this area. For both northbound and southbound travelers on Monterey Road, views of the lower portions of elements in the laydown area would be partially screened by the railroad berm which is located between the laydown area and road and is elevated several feet above the roadway.

Because views of the upper portions of elements within the laydown area would be visible, visual quality of existing views of the laydown area by southbound travelers on Monterey Road would be substantially reduced. Visual quality of views of the laydown area from southbound passenger trains, which would not be screened by the railroad berm and would be fully visible, would also be substantially reduced from moderately high to moderately low. However, visual sensitivity is moderate due to the fairly short duration of views of the laydown area. Therefore, the visual impact would be less than significant.

Visual quality of existing views of the construction laydown area by northbound travelers on Monterey Road would not be substantially reduced because the lower elements of the laydown area would be mostly screened by the railroad berm and elements of the roadway corridor in the viewers' immediate foreground would be dominant and would reduce the impacts of views of the taller elements in the laydown area. Views of the laydown area from residences on the east side of Monterey Road would be largely screened by the railroad berm and vegetation. For these reasons, visual impacts of the laydown area for views by northbound travelers on Monterey Road and from residences along the east side of Monterey Road would be less than significant. For northbound passengers on trains, visual quality would be substantially reduced from moderately high to moderately low for the same reasons described above for southbound views from passing trains. However, visual sensitivity is moderate for passenger trains. Therefore, visual impacts of the laydown area for views from northbound passenger trains also would be less than significant.

Impacts to Views of the Laydown Area from Santa Teresa Boulevard

Views of the laydown area from Santa Teresa Boulevard have moderately high visual quality and moderate visual sensitivity. Visual Resources Figure 8 shows an existing view from this area from KOP 4. Although the laydown area would be visible in the middleground, it would be fairly low in profile and would not contrast strongly in form with other elements of the view. From this location and distance, it would appear similar in scale, form, and character to the nearby structures along Blanchard Road and would reduce the overall visual quality only slightly. For these reasons, visual impacts of the laydown area for views from Santa Teresa Boulevard would be less than significant.

Mitigation Measures

Recognizing the potential for significant impacts associated with views of the construction laydown area, the applicant has proposed mitigation measures as part of the proposed project. These include:

- collaborating with residents of one home on the north side of Blanchard Road to design and install a fence around the northern and eastern sides of the property for screening construction period activities (Calpine/Bechtel 2000, p. 8.11-29);
- planting trees along the west side of Monterey Road and between the road and railroad tracks at the beginning of construction to provide a modest level of screening and visual enhancement in the area immediately along the road (Calpine/Bechtel 2000, p. 8.11-31); and
- developing a plan for the laydown and staging area that will rely on placement of structures and fencing to screen the less attractive elements of the temporary facility from views of the road (Calpine/Bechtel 2000, p. 8.11-31).

Although these mitigation measures would help reduce significant visual impacts somewhat, some additional measures would be necessary to reduce visual impacts to less than significant levels. In addition to the applicant's mitigation measures, the following mitigation measures are necessary to help lessen the visual impacts of the laydown area and reduce significant visual impacts to less than significant levels. These measures are proposed as Condition of Certification VIS-5.

- Minimize the overall size of the construction laydown area and locate it as far as possible from the residences along Blanchard Road and from the railroad tracks and Monterey Road.
- Design and install high quality, aesthetic screening around the exterior of the laydown area for the full length of the south and east sides and any portion of the north side that may be visible to travelers on Monterey Road or passenger trains to a height that screens views from the Blanchard Road area and Monterey Road of the lower portions of equipment, vehicles, buildings, and materials in the laydown area and screens views of most of the lower portions of these elements for views from trains.
- Provide natural appearing, undulating berms along the west side of Monterey Road in addition to the proposed planting.

IMPACTS TO VIEWS OF OTHER AREAS DURING CONSTRUCTION

Construction of all elements of the project other than the power plant would require less than 1 year. Therefore, construction activities, including use of construction staging areas other than the construction laydown area described above, would be of short duration. Because visual impacts of short duration construction activities would be less than significant, the visual impacts of construction for these other areas would be less than significant.

PIPELINES

Several routes for below-ground electric, water, and gas lines would be visible from some locations. With the exception of one gas metering station, these routes would not contain any above-ground elements after construction and the construction period for these pipelines would be less than one year. The applicant has proposed mitigating any potential long-term visual impacts of the pipelines by restoring the ground surfaces of the pipeline routes to their original condition after construction, and staff has specified the requirement for this in Condition of Certification VIS-4. Because a) the construction period for the pipelines would be temporary and short-term (i.e., less than one year in duration), b) ground surfaces would be restored immediately following construction as identified in Condition of Certification VIS-4, and c) the pipelines would contain no visible above-ground elements other than the gas metering station, the visual impacts of these pipelines would be less than significant for conditions both during and after their construction. It is assumed that the construction period for the gas metering station would be less than one year and any visual impacts of the gas metering station during its construction are assumed to be similar to the impacts following its construction, which are discussed below. Therefore, the visual impacts of the gas metering station during its construction are not discussed further.

OPERATION IMPACTS

IMPACTS TO VIEWS FROM BLANCHARD ROAD AREA

Impacts on Existing Setting

Views of the proposed power plant from the Blanchard Road area have moderately high visual quality and high visual sensitivity. Visual Resources Figure 20 shows the proposed project 5 years after its completion as it would appear from the Blanchard Road area from KOP 1. The facility would appear as several tall and massive structures in the foreground near the base and in front of Tulare Hill. The two tallest structures, consisting of the screened HRSG units and stacks, are designed to have similar characteristics to office buildings with simulated wrap-around window bands in their lower portions. However, the metal catwalks that extend out from and wrap around the screening near the tops of the HRSG stacks break the vertical lines and give the stacks a more industrial appearance. Also, the steel top works, which would be clearly visible above the HRSG screening structures, would indicate an industrial character for the facility. These tall structures, including the features which contribute to the power plant's industrial character, would be clearly silhouetted against the sky above the ridgeline of Tulare Hill, drawing attention to the facility and away from its rural setting.

The cooling tower structure would be a massive rectilinear structure without the appearance of windows and, with the nearby large tanks, would appear industrial in character. However, viewed from this location, these structures would not penetrate the sky above the ridgeline and consequently would be somewhat absorbed into the background hill. Their massive forms, however, would block a large portion of the grass-covered lower slope of Tulare Hill and reduce the intactness of the view.

To viewers from the south, the 95-foot high twin HRSG structures and the 145-foot-high HRSG stacks would appear massive and bulky relative to the natural forms of their surroundings and the existing much thinner and lighter transmission towers visible along the ridge. These massive structures would dominate their setting and contrast strongly in form, line, and texture with the existing, much lighter transmission towers they would replace in the view. The HRSG stacks, cooling tower, and water tank would contrast with each other in form and style and they would contrast substantially with their rural and natural surroundings in form, line, and texture.

The distinctive line of tall, natural-appearing, mature trees would be replaced by the large structures and a line of shorter, evenly spaced trees at their base. Because few large trees are seen on the valley floor (City of San Jose 1985, p. 4), this existing intact grove is an important visual element that provides visual interest and variety and contributes to the rural and natural character and visual quality of the area and views from the Blanchard Road area. The project's smaller trees that simulate orchards would support the rural character of the area and provide some visual variety and interest. However, the new and much smaller trees would appear far more neat and manicured, thus substantially changing the more natural, rural character of the views of this area. Because of the tall height and bulk of the twin HRSG structures, it appears that it would take at least 20 years for the redwood trees to reach a height where they would substantially screen the lower portion of these structures. A portion of the open agricultural field would also be displaced by the facility, reducing the area's overall sense of openness. The west access road may be visible, but because of its low profile it is unlikely to be very noticeable or cause a substantial reduction in visual quality for views from the Blanchard Road area.

The power plant would introduce new forms, textures, lines, and colors that would substantially reduce the intactness, unity, vividness, and therefore visual quality of existing views from the Blanchard Road area. Existing views of the open agricultural field, trees, grass-covered hill, and transmission towers would be substantially changed in character from rural to industrial. The visual character and quality of foreground views with high visual sensitivity would be substantially reduced from moderately high to moderately low. For these reasons, visual impacts of the proposed power plant would be significant for views from the Blanchard Road area.

Future Conditions with Campus Industrial Area

If the planned Campus Industrial Area develops as expected, future visual sensitivity for views from this area would be moderately high for workers at the NCVCIA and would continue to be high for residences along Blanchard Road. Visual impacts on foreground views of the proposed power plant from this area would be similar to those described above for existing views. Although the visual character of the area to the south is expected to change, views to the north could be expected to continue to be dominated by rural and natural forms and elements. This is reinforced by the current Master Development Plan for the area (City of San

Jose 1985) that shows the site of the proposed power plant as largely a riparian area. Although the City has indicated that designation of this area as riparian is likely to change with adoption of a revised master development plan (Kent Edens et al. pers. comm. 2000), the area is still designated as such in the current plan.

For likely future conditions, views from residences in the Blanchard Road area and the Campus Industrial Area with high and moderately high visual sensitivity, the visual character and quality of foreground views would be substantially reduced from moderately high to moderately low and visual impacts of the proposed power plant would be substantial.

Mitigation Measures

The proposed project would substantially reduce the visual character and quality of views of the site and its surroundings largely because of the power plant's mass, scale, height, and industrial character. Because these factors are intrinsic to the function of the proposed project and the design features and mitigation measures proposed by the applicant cannot substantially reduce the visual impacts that would result from these factors, the residual impacts would be significant. No additional mitigation measures are feasible, so the residual visual impacts for views from the Blanchard Road area would be significant and unmitigable.

IMPACTS TO VIEWS FROM NORTHBOUND MONTEREY ROAD, RAILROAD, COYOTE, AND RESIDENCES

Impacts on Existing Setting

Views of the proposed power plant site from northbound Monterey Road, Coyote, and residences along the east side of the road have moderate visual quality. Views from the railroad are of moderately high visual quality. Visual sensitivity is moderately high for views from the road, moderate for views from the railroad due to their fairly short duration, moderately low to moderate from in and around Coyote, and high for views from residences along the east side of the road. Visual Resources Figure 21 shows the proposed project 10 years after its completion as it would appear for northbound travelers on Monterey Road from KOP 2. This view is from just south of Blanchard Road.

The facility would appear as tall, massive structures in the foreground near the base and in front of Tulare Hill. The two tallest structures, consisting of the screened HRSG units and stacks, are designed to have similar characteristics to office buildings with wrap-around screens intended to simulate bands of windows and floors on the HRSG units. The steel top works, which would be clearly visible above the HRSG screening structures, and the metal catwalks protruding from the HRSG stacks, would indicate an industrial character for the facility. These tall structures would be clearly silhouetted against the sky above the ridgeline of Tulare Hill, drawing attention to the facility and away from its rural setting.

For these views, the cooling tower would be mostly behind the twin HRSG structures and largely screened by them. Viewed from this location, the cooling tower and large tanks would not penetrate the sky above the ridgeline and would be

partially visually absorbed into the background hill. The large tanks and much of the visible portion of the cooling tower would be mostly screened by trees within about 10 years of plant startup.

To viewers from Monterey Road, the railroad, Coyote, and residences to the southeast, the 95-foot high twin HRSG structures and 145-foot-high HRSG stacks would appear massive and bulky relative to the natural forms of their surroundings and the existing much thinner and lighter transmission towers visible along the ridge and behind the plant. These massive structures would dominate their setting and contrast strongly in form, line, and texture with the existing, much lighter transmission towers in the view. The HRSG structures, including the stacks and topworks, would contrast substantially with the rural and natural forms, lines, and textures of their surroundings.

The existing mature grove of trees would be replaced by the large structures and shorter, more neatly ordered trees at their base. Although views of the existing trees are distinctive, elements such as the concrete median, light standards, signs, and telephone poles in the roadway corridor in the immediate foreground somewhat reduce the intactness of views from this area and slightly reduce the distinctiveness of views of these trees. The redwoods and smaller trees simulating orchards would somewhat offset the loss of views of these mature trees; however, this effect would not be apparent for at least 10 years and would not be fully realized for about 20 years. Visual Resources Figure 22 is a photosimulation of an earlier version of the project showing the vegetation as it could appear in 20 years as viewed from Monterey Road.

Although the photograph shows a large expanse of pavement in the near foreground dominating the view, the location is on the eastern side of the road, and this amount of pavement would not be as apparent in views from vehicles. However, elements within the roadway corridor would tend to diminish the overall contrast of the structures with their surroundings.

The power plant would introduce new forms, textures, lines, and colors that would somewhat diminish the intactness, vividness, and unity of views from northbound Monterey Road, Coyote, and nearby residences. Existing views of the mature trees and grass-covered hillside would be changed in character from rural to industrial. Therefore, the visual character and quality of foreground views from northbound Monterey Road, Coyote, and residences with moderately low to high visual sensitivity would be incrementally reduced from moderate to moderately low. For these reasons, visual impacts of the proposed power plant for views from northbound Monterey Road, Coyote, and nearby residences would not be substantially reduced and would be less than significant.

The visual character and quality of foreground views from northbound passenger trains would be substantially reduced from moderately high to moderately low. However, visual sensitivity of views from passenger trains is moderate due to the fairly short duration of viewing time. Therefore, visual impacts of the proposed power plant for views from northbound passenger trains also would be less than significant.

Future Conditions with Campus Industrial Area

If the planned Campus Industrial Area develops as expected, numbers of people with moderately high viewer sensitivity would have views of the power plant and future visual sensitivity for views from this area would increase somewhat. Visual impacts for foreground views of the proposed power plant from this area would be similar to those described above for existing views. The visual character and quality of foreground views from northbound Monterey Road, Coyote, and nearby residences with moderately low to high visual sensitivity would be reduced somewhat from moderate to moderately low. Visual quality for views of the proposed power plant from northbound trains would be substantially reduced from moderately high to moderately low, but visual sensitivity for these views is moderate. For these reasons the visual impacts of the proposed power plant for views with future conditions would not be substantial.

Mitigation Measures

Because visual impacts for views from northbound Monterey Road, the railroad, Coyote, and nearby residences would be less than significant, no additional mitigation is required to reduce these impacts to less than significant. However, because of the visual sensitivity of the area and the substantial reduction in the visual character of the area caused by the power plant, staff proposes Condition of Certification VIS-9 for changes to the architectural design treatment of the power plant to help reduce these visual impacts.

IMPACTS TO VIEWS FROM FUTURE OVERCROSSING FOR CAMPUS INDUSTRIAL AREA

Impacts on Existing Setting

Presently, the overcrossing entry for the parkway into the Campus Industrial Area does not exist and people would not normally see the project site from the elevated position at this location. Consequently, a description of visual sensitivity is not applicable and the proposed power plant would not cause visual impacts.

Future Conditions with Campus Industrial Area

The overcrossing is a central feature of the planned Campus Industrial development that is intended to be constructed in the foreseeable future. This elevated entry to the development is intended to be the primary and most important gateway to the development, providing visitors, workers, and others with important impressions. The overcrossing is also intended to provide a multi-use trail for recreationists and bicycle commuters connecting the campus industrial area and east side of the valley with the Coyote Creek Parkchain. For these reasons, the visual impacts of the proposed power plant from this location are analyzed below for likely future conditions.

If the planned Campus Industrial Area develops as expected, views northwest toward the proposed power plant from the future overcrossing would have moderately high to high visual sensitivity and moderately high visual quality. Visual Resources Figure 23 shows the proposed project 10 years after its completion as it would appear in views northwest from the overcrossing from KOP 3. From this

position, the facility would appear as several tall and massive structures in the distant foreground near the eastern shoulder and in front of Tulare Hill. The two tall HRSG structures would be massive and dominant forms that would appear industrial in character. The cooling tower would appear as a massive rectilinear structure. The domed top of the large water tank would be slightly visible farther to the west. The twin HRSG structures would stand above the brow of the hill behind them, drawing attention to the facility and away from its rural setting at the head of the valley. The bulk of the power plant would replace the line of mature trees along the base of the hill.

The massive HRSG structures would dominate their setting and contrast strongly in form, line, and texture with the other elements in their rural and natural surroundings, including the much lighter transmission towers behind them and the complex of rural homes and farming structures to the west. These rural structures are highly visible elements in the view; however, they reinforce the rural character of the area because of their low height, small scale, and distinctive palm trees that are a recognizable feature in rural areas in much of California.

The distinctive line of mature trees and the open field contribute to the visual interest, variety, openness, and rural character in the existing view. These would be replaced by the large structures and mass of planted trees. Over a period of 10 to 20 years, the trees that are to be planted as part of the project would help to somewhat relieve the strong visual contrast of the structures with their surroundings. However, the mass, height, and overall bulk of the project would continue to cause it to appear greatly out of scale with its surroundings.

In the future, once the overcrossing is built, it may be assumed that the campus industrial area would also be developed to some degree. Based on the master plan and guidelines developed for the campus industrial area, it is probable that the power plant would continue to be highly visible from this location. The guidelines call for structures to be developed at the centers of large parcels with generous landscaped setbacks allowing development that is intended to preserve "the present rural aspect of the area." Based on these guidelines, it is likely that the proposed project would be more in character with the campus industrial area than with its present rural surroundings. However, its height and scale would be larger and its building forms more massive and noticeable than the guidelines currently allow. The proposed project's position at the head of the valley and the convergence of the railroad tracks and sloping ridge of Tulare Hill and its massive structures penetrating the ridgeline would draw attention to it and make it highly noticeable in panoramic views of the area from the overcrossing. Also, its architectural style (i.e., the design treatment of the HRSG units and the tall stacks) differs substantially from the architectural style of recently-proposed structures in the southern part of the Campus Industrial Area (Cisco Systems 2000). The contrast in architectural style would further draw attention to the power plant and emphasize its incongruence with its setting under likely future conditions.

Guidelines for development of the campus industrial area are currently being updated and are anticipated to be considered for approval by the City Council later this year. These draft guidelines (City of San Jose 2000b) clarify improvements to

the overcrossing that could help partially screen views of the proposed power plant and direct viewers' attention away from the head of the valley and project site from this future gateway entry. Visual Resources Figures 24 and 25 show landscape screening, fencing, light poles, and sculptures intended to be developed at the entry overcrossing that would greatly reduce viewers' attention toward the project. Although these draft guidelines have not been adopted, they indicate a strong intention by the City to require improvements as part of development of the campus industrial area that would meet the intent of focusing views from the overcrossing toward the west.

The proposed power plant would introduce new forms, textures, and lines that would substantially reduce the intactness, unity, vividness, and therefore visual quality of future views of this area from the overcrossing. Views of the site and its surroundings would be substantially changed in character from rural and campus-like business commercial to industrial. The visual character and quality of foreground views with moderately high to high visual sensitivity would be substantially reduced from moderately high to moderately low. However, viewers' attention would likely be directed away from the power plant and views of the plant would be partially screened by improvements intended as part of the development of the future overcrossing. For these reasons, visual impacts for views of the proposed power plant from the future overcrossing for the Campus Industrial Area would not be substantial. Although the proposed project would substantially reduce the visual character and quality of views of the site and its surroundings for future views from the overcrossing, future conditions that would permit these views would also effectively reduce these visual impacts.

Mitigation Measures

The project's visual impacts for existing conditions would be less than significant. Therefore, no mitigation measures would be required beyond those design features identified by the City to be developed as part of the overcrossing's design and what the applicant has identified as part of the proposed project.

IMPACTS TO VIEWS FROM SANTA TERESA BOULEVARD

Impacts on Existing Setting

Views toward the project site from Santa Teresa Boulevard have moderately high visual quality and moderate visual sensitivity. Visual Resources Figure 26 shows an earlier version of the proposed project as it would appear to northbound travelers on Santa Teresa Boulevard from KOP 4.

The facility would be visible in the middleground of the view north across the open valley. The HRSG structures and stacks would be noticeable at the eastern toe of Tulare Hill. The vertical forms and banded patterns of the twin structures would contrast with the surrounding elements of the open agricultural fields and grass-covered hillsides. The facility's color would blend reasonably well with its surroundings in this middleground view. Although the facility would contrast in character with its rural setting, the surrounding hills and open fields dominate the

overall view and the structures would be subordinate to these larger landscape elements.

The proposed project would introduce new forms, textures, lines, and colors that would slightly reduce the intactness, unity, vividness, and therefore visual quality of existing views from Santa Teresa Boulevard. However, the rural character of existing views of the open agricultural fields and grass-covered hills would not be substantially changed by the project because these larger landscape elements dominate the overall view. For these reasons, the proposed project would not substantially reduce the existing moderately high visual quality of the view from Santa Teresa Boulevard. In addition, the visual sensitivity of existing views toward the proposed project is moderate. Therefore, the visual impacts of the proposed project would be less than significant for views from Santa Teresa Boulevard.

Future Conditions with Campus Industrial Area

If the planned Campus Industrial Area develops as expected, future visual sensitivity for views from this area would be moderately high. Visual impacts of middleground views of the proposed power plant from this area would be similar to those described above for existing views except that some features of the Campus Industrial Area development are likely to screen or reduce the dominance of the power plant. Where the power plant is visible, it is likely that its appearance will contrast with that of other buildings recently proposed in the southern part of the Campus Industrial Area. However, its contrast with other buildings would not be strongly apparent because the power plant would be partially screened, other structures would be closer to viewers and more visually dominant, and the power plant would be visible in middleground views. Therefore, the visual character and quality of views with moderately high visual sensitivity would not be substantially reduced and visual impacts of the proposed power plant would not be substantial for future views from Santa Teresa Boulevard.

Mitigation Measures

Because the proposed project's visual impacts on existing views from Santa Teresa Boulevard would be less than significant, no additional mitigation is required beyond what the applicant has identified as part of the proposed project.

IMPACTS TO VIEWS FROM HIGHWAY 101

Impacts on Existing Setting

Views of the proposed power plant from Highway 101 have moderately high visual quality for northbound views and moderately low to moderate visual quality for southbound views. Visual sensitivity is moderately high for both northbound and southbound views for existing conditions.

Visual Resources Figure 27 shows the proposed power plant as it would appear for northbound travelers on Highway 101 from KOP 5. The upper portions of the HRSG structures and stacks and a small portion of the cooling tower would be visible in foreground views. Existing berms and vegetation along the highway and

in the median area would screen views of the lower portion of the structures at the power plant. Elements that include the highway corridor, trees, and grass-covered Tulare Hill dominate the view from this area. The structures would be positioned well below the ridgeline of the hill and would be subordinate to it and other elements in the view.

Because the structures would appear as an industrial facility, they would change the rural character of the view somewhat. They would also add forms and textures that somewhat reduce intactness, vividness, and unity of the rural landscape view from moderately high to moderate. However, because the structures would be partially screened and largely subordinate to the overall view, they would not substantially reduce the overall visual quality of this view with moderately high visual sensitivity. In addition, the duration is fairly short for views of the project site in the foreground distance zone. Similarly, for southbound views from the highway, the proposed project would not substantially reduce the existing moderately low to moderate visual quality and the view duration is fairly short. For these reasons, visual impacts of the portion of the proposed power plant project located west of Highway 101 would be less than significant.

The proposed gas metering station would be located along the east side of and within the scenic corridor of Highway 101 about 370 feet from the highway where it would be visible in foreground views to high numbers of viewers with high viewer sensitivity. Visual sensitivity for views from the highway is high and visual quality is moderately high.

The gas metering station would consist of piping, valves, a prefabricated shed, and other items within a chain link fence enclosure measuring approximately 35 feet by 80 feet. The shed would be 10 feet high, the fence would be 8 feet high, and other elements would be not more than 5 feet high. The fence would have a non-reflective finish. A short access road would run to the gas metering station. The facility would have no permanent outdoor lighting. Similar to nearby structures, the facilities would be dark brown in color and have non-reflective finishes to help integrate them with their surroundings. Landscape screening would be provided around the exterior of the facility to help visually screen it and integrate it with its surroundings. Shrubs would be used that are drought-tolerant; these would be the same species as or similar in appearance to large shrubs existing near the site. Plants would be planted in informal, naturalistic patterns to blend with the existing character of the surrounding landscape.

Although the gas metering station would be visible to high numbers of viewers within a scenic highway corridor and have high visual sensitivity, the proposed project includes a number of features that would help the facility blend with its surroundings. These features include the screening, plantings, colors, and generally low heights of the facilities described above. Provided that all of these features are implemented and maintained as part of the project, the intactness, vividness, and unity of views that include the gas metering station site would not be substantially reduced. Therefore the existing visual character and quality of these views would not be substantially reduced and the visual impacts would be less than significant.

Future Conditions with Campus Industrial Area

If the planned Campus Industrial Area develops as expected, visual sensitivity for views of the power plant from Highway 101 for likely future conditions would also be moderately high. Visual impacts of foreground views of the proposed power plant from the highway would be similar to those described above for existing views. Because the visual character and quality of foreground views with moderately high visual sensitivity would not be reduced substantially, visual character and quality of the proposed power plant with future conditions also would not be substantially reduced for views from Highway 101. In addition, views of the gas metering station for likely future conditions would continue to be of high visual sensitivity and moderately high visual quality and visual impacts would be similar to those described above for existing conditions. Therefore, the visual character and quality of views of the gas metering station with likely future conditions would not be reduced substantially for views from Highway 101.

Mitigation Measures

Because visual impacts for views from Highway 101 of the main portion of the proposed power plant west of Highway 101 and the gas metering station east of the highway would be less than significant, no additional mitigation is required beyond what the applicant has identified as part of the proposed project. Staff proposes Condition of Certification VIS-8 for aesthetic treatment and landscape screening for the gas metering station to minimize its visual impacts by ensuring that the applicant's proposed mitigation measures will be properly implemented.

IMPACTS TO VIEWS FROM PARKWAY LAKES

Impacts on Existing Setting

Views of the proposed power plant from the Parkway Lakes recreation area have moderate visual quality. Visual sensitivity is moderately high for existing conditions. Visual Resources Figure 28 shows an earlier version of the proposed project as it would appear to viewers from Parkway Lakes from KOP 6. Approximately the upper half of the tall HRSG structures and stacks would be visible in middleground views. The structures would have the appearance of an industrial facility. The tall industrial-like structures would protrude noticeably above the trees in the foreground. By screening the lower portion of the structures, the riparian trees would help absorb their forms and lines. Although noticeable, the structures would be generally subordinate to the larger elements of riparian trees in the overall view. Their form, line, texture, and to a lesser degree color, would reduce the view's intactness and unity somewhat, but would not affect its vividness. Existing power transmission towers in the view are similar in height to the twin structures and also protrude above the riparian trees and horizon line. Although lighter in texture than the power plant structures, the transmission towers would help somewhat to reduce the impact of the power plant in this middleground view.

Largely because of its industrial-like character and tall forms protruding above the trees, the proposed project would somewhat reduce the visual quality of views from Parkway Lakes. However, because the structures would be partially screened and

largely subordinate to the overall view, they would not substantially reduce the overall visual quality of this view with moderate visual quality and moderately high visual sensitivity. For these reasons, visual impacts of the proposed project for views from Parkway Lakes would be less than significant.

Future Conditions with Campus Industrial Area

If the planned Campus Industrial Area develops as expected, visual sensitivity for views from this area for likely future conditions may be slightly affected, but would continue to remain moderately high. Visual quality would remain moderate. Visual impacts of the proposed power plant in middleground views from Parkway Lakes would be similar to those described above for existing views. Because the visual character and quality of middleground views with moderately high visual sensitivity and moderate visual quality would not be reduced substantially, visual impacts of the proposed power plant with likely future conditions would not be substantial for views from Parkway Lakes.

Mitigation Measures

Because visual impacts for views from the Parkway Lakes recreation area would be less than significant, no additional mitigation is required beyond what the applicant has identified as part of the proposed project.

IMPACTS TO VIEWS FROM COYOTE RANCH AND COYOTE CREEK TRAILS

Impacts on Existing Setting

Views of the proposed power plant from Coyote Ranch have moderately high visual quality and high visual sensitivity for existing conditions. For this analysis, it is assumed that any views from recreation trails along Coyote Creek would have similar conditions to those for views from Coyote Ranch and any visual impacts would be similar as well. Visual Resources Figure 29 shows the proposed project as it would appear from the ranch grounds from KOP 7. Approximately the upper half of the tall HRSG structures, including the stacks and top works, would be visible in foreground views. However, existing riparian trees in the creek corridor would screen views of the lower portion of the power plant structures and the structures would not penetrate the horizon line of Tulare Hill and therefore would not be seen against the sky. The combination of screening of the lower portions of the power plant by the riparian trees and the fact that the power plant would not extend above the horizon line would cause the power plant to be somewhat visually absorbed into the overall view. Also, several transmission towers nearby the ranch are visible in views of the plant from Coyote Ranch and contribute somewhat to reducing the plant's contrast with its surroundings.

The power plant would introduce new forms, lines, and textures that would contrast with the surrounding natural and rural elements in the landscape, reducing the intactness, vividness, and unity of views of the project site from Coyote Ranch incrementally from moderately high to moderate. Also, the presence of the power plant would somewhat reduce the visual character of the existing rural views from the ranch area. Because the proposed power plant would not substantially reduce

the existing visual quality and character of the views from the ranch and nearby trails, the visual impacts of the proposed project for these views would be less than significant.

Future Conditions with Campus Industrial Area

If the planned Campus Industrial Area develops as expected, future visual sensitivity for views from this area would continue to be high. Visual impacts of foreground views of the proposed power plant from Coyote Ranch would be similar to those described above for existing views. Because the visual character and quality of foreground views with high visual sensitivity would not be reduced substantially, visual impacts of the proposed power plant with future conditions would not be substantial for views from Coyote Ranch and nearby trails.

Mitigation Measures

The proposed project would not substantially change the visual character or reduce the visual quality of views of the site and its surroundings from Coyote Ranch. However, it would introduce new elements that would somewhat change the visual character and reduce the quality of the existing views from Coyote Ranch. In recognizing the potential for visual impacts and the high visual sensitivity of the views, the applicant has proposed potential mitigation to reduce the visual impacts of the proposed project. This mitigation would involve working with the ranch's operator to identify measures that would reduce the project's effects on views, including placing trees along Coyote Ranch Road between the power plant and viewers to screen views of the project. For this measure to be effective, the trees would have to reach a height of at least 40 feet before they screened the majority of the power plant from view. Growing trees to this height would require a substantial length of time. Although the trees would not have a substantial effect on screening views of the power plant for many years, it would be appropriate for the applicant to proceed with the suggested planting to help reduce visual impacts of the project in the future. Therefore, Condition of Certification VIS-7 should be implemented to help reduce the long-term visual impacts of the proposed project.

IMPACTS TO VIEWS FROM SOUTHBOUND MONTEREY ROAD AND THE RAILROAD

Impacts on Existing Setting

The visual quality of views of the proposed power plant site from southbound Monterey Road and the railroad varies from moderately low to moderately high as viewers progress south. Visual Resources Figure 30 shows the proposed project as it would appear for southbound travelers on Monterey Road from KOP 8 near the toe of Tulare Hill. Visual quality of views from north of the site and the northern portion of the site is moderately low. As viewers progress south, the visual quality of views that include the portion of the project site south of the central grove of trees improves to moderately high. Visual sensitivity is moderate based on the intermittent and fairly short duration of views of the project site.

The facility would appear as tall, massive structures in the foreground of views from the road. From the road, the upper portions of the HRSG stacks and the top works

would be highly visible and give the structures the appearance of industrial facilities. The tall, industrial-like structures would appear more massive than and protrude noticeably above the surrounding elements in this foreground view. As the viewer progresses south, the structures would become increasingly dominant in the foreground. Other structures at the facility would also become visible in foreground views.

For views from farther north along the road, intactness, unity, and vividness would be reduced somewhat by the introduction of substantially more massive structures than currently exist in the view. Also, the introduction of massive elements with an industrial-like character would substantially change the character of the rural roadside views to more industrial. For views farther south along the road, the massive industrial-like structures would be further to the periphery of the view cone, but very close in proximity to viewers and their height and bulk would be imposing. Other plant facilities, such as the cooling tower, tanks, switchyard, and various buildings, may be visible from the road and railroad, but would be farther back, lower in height, and therefore less noticeable and less visually imposing. The massive HRSG structures would dominate their setting and contrast strongly in form, line, and texture with the other more rural and natural elements nearby.

The grove of mature trees on the site would be replaced by the large structures and shorter trees that would be planted along the road. The walnuts, oaks, and other initially smaller trees and shrubs that would be planted to reduce the visual impacts of the power plant would somewhat offset the loss of views of these mature trees and eventually would help screen foreground views of the project. However, this screening effect would not be fully realized for many years, especially considering the slow growth rate of oaks.

The power plant would introduce new forms, textures, lines, and colors that would substantially reduce the intactness, unity, vividness, and visual quality and substantially change the visual character of southbound views from the railroad and a portion of southbound Monterey Road, both with moderate visual sensitivity. Visual quality would be reduced from moderately high to moderately low for views from Monterey Road near the project site. The visual character of the site and its surroundings would be substantially changed from rural to industrial. Although trees that would be planted along the road would eventually reduce some of these visual impacts somewhat, visual impacts of the proposed power plant would be substantial for views from a portion of southbound Monterey Road and the railroad. However, because visual sensitivity from southbound Monterey Road is moderate due to the fairly short duration of the views, the visual impacts would be less than significant.

Future Conditions with Campus Industrial Area

If the planned Campus Industrial Area develops as expected, future viewer sensitivity for views from this area would increase. However, views of the project site would continue to be intermittent and fairly short in duration, so visual sensitivity would continue to be moderate. Visual impacts of foreground views of the proposed power plant from this area would be similar to those described above for existing views. Because the visual character and quality of foreground views with moderate

visual sensitivity would be reduced from moderately high to moderately low, visual impacts of the proposed power plant with likely future conditions would not be substantial for views from southbound Monterey Road and the railroad.

Mitigation Measures

The proposed project would substantially reduce the visual character and quality of views of the site and its surroundings from southbound Monterey Road and the railroad largely because it would introduce new elements that would substantially change the visual character and reduce the visual quality of the views. Recognizing the potential for visual impacts, the applicant has identified potential mitigation to reduce them by planting trees that would screen views of the project from the road and planting shrubs along the eastern boundary of the project to screen some views of the project from the railroad. It is anticipated that the trees would eventually reach a height and density that would be effective for screening views of the project's facilities from the road. Until the vegetation develops into an effective screen, the power plant would substantially reduce the visual character and quality of views. However, the project would be visible for fairly short durations from both the railroad and Monterey Road. The row of shrubs proposed to be planted along the eastern boundary of the project would provide some screening of the lower portions of the project from the railroad after several years. However, the elevated height of the trains on the railroad berm would elevate the height of the viewers and reduce the effectiveness of these plantings for screening views of most of the power plant's features.

Because the proposed plantings would not be effective for screening views from the trains, the design features and mitigation measures proposed by the applicant would not substantially reduce the visual impacts of the power plant. However, implementation of the applicant's proposed mitigation through Condition of Certification VIS-5 for aesthetic screening would help reduce the visual impacts of the proposed project for views from southbound Monterey Road and passenger trains.

IMPACTS TO VIEWS FROM BASKING RIDGE AREA

Impacts on Existing Setting

Views of the proposed power plant from the Basking Ridge area have moderate visual quality and moderately high visual sensitivity for existing conditions. Visual Resources Figure 14 shows an existing view in the direction of the project from this residential area from KOP 9. The upper portions of the HRSG structures would probably be visible in middleground views. However, given the distance and variety of other elements (e.g., the freeway, riparian corridor, and expansive hills) that would dominate the views from this location, the power plant would be subordinate to the larger elements in the overall view and it would not be very noticeable. The project would not substantially reduce the intactness, vividness, unity, or visual quality of the view from this area and it would not substantially change its visual character. For these reasons, visual impacts of the proposed project would be less than significant for views from the Basking Ridge area.

Future Conditions with Campus Industrial Area

If the planned Campus Industrial Area develops as expected, future visual sensitivity for views from this area would continue to remain moderately high. Visual impacts of middleground views of the proposed power plant from this area would be similar to those described above for existing views. Because the visual character and quality of middleground views with moderately high visual sensitivity would not be reduced substantially, visual impacts of the proposed power plant with future conditions would not be substantial for views from the Basking Ridge area.

Mitigation Measures

Because visual impacts on views from the Basking Ridge area would be less than significant, no additional mitigation is required beyond what the applicant has identified as part of the proposed project.

IMPACTS TO VIEWS FROM FISHER CREEK CORRIDOR

Impacts on Existing Setting

Fisher Creek is designated as a trail corridor in the NCVCA Master Development Plan (City of San Jose 1985). Presently, there is not a public trail along the Fisher Creek corridor. Because there is not currently public access along the corridor, people would generally not have views of the proposed project from this area. Consequently, a discussion of visual sensitivity is not applicable and visual impacts would not be significant for the existing baseline condition.

Future Conditions with Campus Industrial Area

For likely future conditions, a multi-use trail would be developed along Fisher Creek (City of San Jose 1985, pers. comm. Elish Ryan, per. comm. Brad Brown) and the planned Campus Industrial Area would be developed. With these likely future conditions, visual sensitivity would be high for views from the trail corridor. Travelers moving along the trail corridor would have intermittent but potentially regular and long-duration views of the power plant. These views would be at close range and would include the HRSG structures, cooling tower, tanks, buildings, switch yard, fences, west access road, and other facilities. Visual quality of views from the future trail corridor along Fisher Creek would be highly variable, ranging from low to moderately high depending on the viewers' position and orientation. Visual Resources Figure 15 shows an existing view looking north in the direction of the project from KOP 10 which is along the creek corridor near the southwest corner of the project site. Views of the power plant from this area would be dominated by the massive forms and tall structures of the power plant in the immediate foreground. The west access road would be adjacent to the riparian corridor and highly visible in the immediate foreground of views from the trail. These elements would substantially reduce intactness, vividness, unity, and therefore the visual quality of the views from the trail.

Extensive planting of the riparian corridor proposed as part of the project would probably reduce the visual impacts of some of these foreground views of the power plant. However, extremely dense plantings in some areas could also reduce open

views of the landscape that contribute to the moderately high visual quality of views in the area. Visual Resources Figure 31 shows a visual simulation of the view in the direction of the project from the same location as Visual Resources Figure 15 with a dense hedge of vegetation screening views of the power plant. The applicant has proposed the dense hedge as mitigation to screen views of the power plant and thus reduce the project's visual impacts on future viewers that would use the Fisher Creek trail corridor for recreation. The top of one HRSG stack is barely visible above the hedge near the left of the view. Although the hedge would effectively screen views of the power plant, it would also obstruct moderately high quality views of the surrounding landscape shown in the existing view in Visual Resources Figure 15.

For likely future conditions, the proposed project would substantially reduce the visual character and quality of some views of the project site and its surroundings from portions of the Fisher Creek trail corridor largely because it would introduce new industrial elements that would substantially change the visual character and reduce the quality of those views. Given the proximity of the power plant to the creek corridor, it would dominate views from the trail at numerous locations. Where visible, the power plant would be very noticeable and it would substantially reduce the intactness, vividness, unity, and therefore visual quality of the views from moderately high to moderately low. In addition, the power plant would substantially change the rural and natural character of the views of this area to more industrial in character. For these reasons, visual impacts of the proposed project would be substantial for future views from the Fisher Creek trail corridor.

Mitigation Measures

Because visual impacts for views from the Fisher Creek corridor would not be significant, additional mitigation is not required. Recognizing the potential for visual impacts to future viewers from the Fisher Creek trail corridor, the applicant has identified potential mitigation to reduce those impacts by planting dense shrubs to screen views of the project from some locations. Although the shrubs could effectively screen some views of the project, they would also obstruct some open views of the surrounding natural and rural landscape that are of moderately high visual quality (e.g., views of the surrounding hills, open agricultural fields, and riparian trees). Because of this, visual impacts of views of the proposed project would be replaced by a loss of views of the rural and natural landscape with moderately high visual quality. Therefore, the visual impacts of the project would remain substantial.

Because the factors contributing to the visual impacts are intrinsic to the function of the proposed project and the mitigation measure proposed by the applicant would itself substantially reduce visual quality, the residual impacts would be substantial. Therefore, the applicant should not implement its proposed mitigation for dense landscape screening along the Fisher Creek corridor and Condition of Certification VIS-11 for planting the corridor to enhance views, visual quality, and habitat should be implemented to help reduce visual impacts for views from the future trail along the corridor between Blanchard Road and the railroad tracks.

IMPACTS TO VIEWS FROM COYOTE VALLEY URBAN RESERVE

Impacts on Existing Setting

Views of the proposed power plant from rural residences in the Coyote Valley Urban Reserve have moderately high visual quality and moderately high visual sensitivity for existing conditions. Visual Resources Figure 19 shows an existing view from KOP 11 looking in the direction of the project from this future residential and mixed use area south of the proposed project.

From the southerly portion of the urban reserve, the facility would be visible in middleground views north across the open valley. The HRSG structures and stacks would be noticeable at the eastern toe of Tulare Hill. However, from this viewing distance, the vertical forms of the twin structures would not contrast strongly with the surrounding hills, trees, and rural structures. The facility's color would blend reasonably well with its surroundings in these middleground views.

Although the facility would be noticeable, the surrounding hills and open fields would dominate the overall view and the structures would be subordinate to these larger landscape elements. The proposed project would introduce new forms and lines in this rural landscape; however, it would not substantially reduce the intactness, unity, vividness, and therefore visual quality of the views and the existing rural character would not be substantially changed. For these reasons, the visual impacts of the proposed project would be less than significant on views from the existing rural residences located within the Coyote Valley Urban Reserve.

Future Conditions with Campus Industrial Area

Because the urban reserve area would potentially be developed for residential uses in the foreseeable future, the visual impacts associated with these future conditions are described below. If the planned Campus Industrial Area develops between the urban reserve area and the power plant as expected, the power plant would be even less noticeable in views from existing rural residences for future conditions.

If the planned Campus Industrial Area develops as expected, future visual sensitivity for views from this area would also be moderately high. From the southerly portion of the urban reserve, the facility would be visible in middleground views north across the open valley. The HRSG structures and stacks would be noticeable at the eastern toe of Tulare Hill. However, from this viewing distance, the vertical forms of the twin structures would not contrast strongly with the surrounding hills, trees, and rural structures. The facility's color would blend reasonably well with its surroundings in these middleground views. Although the facility would be noticeable, the surrounding hills and open fields would dominate the overall view and the structures would be subordinate to these larger landscape elements.

Although the proposed project would introduce new forms and lines in this rural landscape, it would not substantially reduce the intactness, unity, vividness, and therefore visual quality of the views. If the planned Campus Industrial Area

develops between the urban reserve area and the power plant as expected, the power plant would be even less noticeable from the urban reserve area for future conditions.

In addition, portions of the urban reserve are also located just south of Coyote Ranch Road and east of Monterey Road where the power plant could be visible in the far foreground and near middleground of potential future views. Visual impacts associated with potential views from future residences in this portion of the urban reserve would be similar to those described above for residences on the east side of Monterey Road.

For the reasons described above, the visual impacts of the proposed project would not be substantial for future views from the Coyote Valley Urban Reserve.

Mitigation Measures

Because visual impacts for views from existing residences in the Coyote Valley Urban Reserve would be less than significant, no additional mitigation is required beyond what the applicant has identified as part of the proposed project.

IMPACTS TO COMBINATION OF VIEWS FROM THROUGHOUT THE AREA

Impacts on Existing Setting

The proposed power plant would be seen regularly by a large number of people from numerous locations throughout the area. Many views would be by residents of the area from homes or while traveling around. The power plant would be seen by a large number of people traveling through and around the area for leisure and work on major roads, including the County-designated scenic Highway 101, and passenger trains. Also, many people would see the power plant from recreational areas and businesses. In effect, thousands of people would view the power plant each day from homes, roads, trains, recreational facilities, and places of business. For many of these views, the power plant would appear in the foreground and be a prominent, if not dominant, element of the view. Visual sensitivity of views of the power plant site for most of the KOPs analyzed is high or moderately high. The existing visual quality of the vast majority of views that include the site is either moderately high or moderate. Only a few very limited or brief duration views are of lower visual quality.

The North Coyote Valley is considered by the City of San Jose to be an important gateway or portal between the City and the more rural and open space lands to the south. The project site lies at the northern head of the valley at the transition between the urban and rural lands and the convergence of major defining visual elements in the landscape; as such, the site occupies an important focal point that is both perceived and real. Many views that contain the power plant site are of high to moderately high visual sensitivity generally because they are seen by viewers who have a high to moderately high awareness of and concern for the appearance of their environment and the power plant site is within the foreground of their views. The City considers it a high priority to maintain the natural and rural agricultural

characteristics of the North Coyote Valley as evidenced in its master development plan for the area.

The power plant would substantially degrade the existing visual character of the site and its surroundings by introducing a major industrial element into a rural setting. The power plant as proposed would also substantially reduce the visual quality of many of the exiting views of the site and its surroundings. Although most of these visual impacts are less than significant for specific views analyzed, the impact of all views, when considered together, is considerable and compounds and increases the overall visual impact of the project. Because the visual character and quality of views with at least moderately high visual quality and moderately high to high visual sensitivity for numerous viewers each day would be substantially reduced, the visual impact of the combination of views of the proposed project from throughout the area would be significant.

Future Conditions with Campus Industrial Area

For likely future conditions, a large portion of the North Coyote Valley south of the project site is intended to be developed for campus industrial uses. With development of the campus industrial area, massive buildings up to 120 feet tall would be widely spaced and surrounded by extensive landscaping reminiscent of orchards.

Although views of surrounding hills are intended to be maintained, many views of the power plant from throughout the area would be screened or softened by development and landscaping within in the Campus Industrial Area. Some buildings in foreground views in the campus industrial area would be likely to be more dominant than the power plant and thus lessen visual impacts. However, for views of the power plant, its proposed architectural design may not be very compatible in style and character with that of future buildings in the Campus Industrial Area.

Assuming that buildings to be built near the power plant would be of a similar design character as buildings recently proposed to be built in the southern part of the Campus Industrial Area, the style of architectural design treatment of the power plant would contrast strongly with that of the buildings. Materials, colors, textures, lines, and forms for these proposed buildings are quite different than those of the power plant. The proposed buildings use some red brick along with red aluminum spandrel panels. Also, fenestration and exterior texturing are generally coarse and complex and roofs are often overhanging or arching. The power plant uses various shades of gray, has almost no fenestration, uses very smooth texturing, and has no overhanging or arching rooflines. The contrast would be likely to draw greater attention to the power plant and emphasize its industrial character. In addition, the HRSG stacks protruding well above the tops of the HRSG screening, the catwalks on the stacks, the exposed topworks, tanks, and other elements of the power plant further add to its appearance as a power plant and contrast with its likely future setting.

Although some visual impacts of the power plant potentially would be lessened by development of the Campus Industrial Area, other impacts potentially would remain the same or increase. For these reasons, visual impacts of the combination of views of the power plant from throughout the area for likely future conditions would continue to be substantial.

Mitigation Measures

The proposed project would substantially reduce the visual character and quality of views of the site and its surroundings largely because of the power plant's mass, scale, height, and industrial character. The applicant's proposed design features and mitigation measures would somewhat lessen the industrial character of the project. It would also be possible to lessen the industrial character of the power plant somewhat further by modifying some elements of the power plant's appearance that draw attention to it as an industrial facility. These changes include screening the exposed topworks on the HRSG units, inseting the catwalks wrapping around the HRSG stacks, and changing the architectural design appearance of the cooling tower and tanks. In addition, the architectural design treatment of the screening for the HRSG units, with clean, horizontal banding and massive, bulky forms, does not fit well with the visual character of the surrounding rural setting and natural forms of hills and trees.

Staff recommends that the design treatment of the HRSG units screening, cooling tower, and tanks be revised to harmonize better with the existing setting as well as the expected future setting with campus industrial development. For all of these reasons, staff proposes Condition of Certification VIS-9. However, some industrial characteristics of the project, especially the upper portions of the HRSG stacks and the height of the stacks, cannot be changed without causing greater impacts. (Screening more of the HRSG stacks would increase the mass of the power plant. Screening the entire height of the stacks is not feasible because of air quality consequences.) Because these project features, as well as the other factors largely responsible for the project causing substantial degradation of the visual character and quality of views of the site and its surroundings (the power plant's mass, scale, and overall height), are intrinsic to the function of the project and cannot be changed, the residual visual impacts after all feasible mitigation would be significant and unmitigable.

LIGHTING

Existing lighting levels are generally very low on and in the immediate vicinity of the proposed power plant site. Nearby sources of existing light include currently occupied temporary rural residences (i.e., mobile homes) on the northern portion of the project site, rural residences and farm buildings about 800 feet southeast of the site, and nighttime traffic on Monterey Road just east of the site. Currently, the existing structures and sources of light are located on the west side of the site near the central grove of trees and are low in elevation. The tall grove of trees on the project site screens most of the light from the on-site structures for views from the south. The railroad berm screens most of the light for views from the east. Topography and trees screen the light from the north and west. The surrounding area is mostly agricultural fields and open space with few or no lights.

The Fisher Creek riparian corridor is adjacent to the site on the west and north. The City of San Jose has policies to protect riparian areas from excessive light and glare; these are addressed in the section “Compliance with Laws, Ordinances, Regulations, and Standards” below. The project site is visible from and within the foreground view corridor of a portion of Highway 101 which is designated as a Rural Scenic Route by the City of San Jose and a scenic highway by Santa Clara County. Visual sensitivity is high for foreground views from the highway. The project site is also visible from other locations in the foreground and middleground of views with high or moderately high visual sensitivity.

Many of the structures and facilities at the proposed project would require lighting for operations, safety, and security. Several of the structures would be massive and tall with heights exceeding 50 feet. Exterior lighting for safety, security, and operations for the proposed power plant has the potential to considerably increase light levels, creating glare and backscatter to the nighttime sky. When viewed from several locations with high visual sensitivity, new sources of light produced by the power plant could be visible in an area that currently has very low light levels. Such lighting could also illuminate the power plant and any visible plumes, revealing its industrial character and degrading the rural character of the vicinity.

The applicant has not submitted specific information on the lighting plan or lighting levels for the project. However, the applicant has proposed measures to reduce these visual impacts (see “Applicant’s Proposed Mitigation Measures”) and Energy Commission staff has expanded on these measures in a proposed condition of certification (see below). The applicant’s proposed mitigation measures for minimizing visible light from the proposed power plant include restricting lighting to areas required for safety and security; direction of lighting onto the site; shielding lighting; use of non-glare fixtures; use of switches, timers, and sensors to minimize the amount of time that lights are on; enclosure of major project structures; and screening using dense landscape planting. Also, the applicant has stated that the plant will remain in darkness during much of the night and no blinking safety lights would be required by the FAA for safety (Calpine/Bechtel 2000, p. 8.11-38).

The project has the potential to produce significant adverse visual impacts by introducing new sources of substantial light or glare in a location that currently has very low light levels and by illuminating the power plant and any visible plumes that may occur. Recognizing this potential, the applicant has identified mitigation measures as part of the proposed project that are intended to substantially reduce the off-site visibility of lighting and will also minimize illuminating the power plant and any visible plumes. With implementation of the applicant’s mitigation measures and Condition of Certification VIS-3, these potential significant adverse visual impacts would be less than significant.

VISIBLE PLUMES

The proposed project would produce visible water vapor plumes from the cooling tower and HRSG exhaust stacks under certain meteorological conditions. The

cooling tower would contain 10 cells and would be 64 feet high and the two HRSG exhaust stacks would be 145 feet high.

No existing sources of water vapor plumes are located in the North Coyote Valley area. In recognizing the visual sensitivity of the area, the applicant has incorporated as part of the plant design for the HRSG stacks “an economizer bypass system that will be used to eliminate a visible water-vapor plume during the rare occurrence of meteorological conditions that may cause visible plumes to occur” (Calpine/Bechtel 1999k, p. 11). The applicant has stated that “under almost all circumstances, no visible plumes will be seen emanating from the plant’s HRSG stacks” (Calpine/Bechtel 2000, p. 8.11-38). However, the applicant has also stated that on rare occasions during the year when temperatures are very low and humidity is high, water vapor plumes from the HRSG stacks and cooling tower could form and be visible and these conditions would tend to occur at night and in the early morning hours.

According to the applicant, the cooling tower would emit visible water vapor plumes with an average height of 68 meters above the ground and a maximum height of about 172 meters above the ground. Average and maximum widths respectively would be 23 meters and 88 meters for each cell. Water vapor plumes would be visible for a total of approximately 188 hours per year. However, water vapor plumes would be visible during daytime hours for a total of 45 hours during any given year. The lengths of visible plumes would vary, with most plumes being less than 400 meters in length.

During a given year, the applicant estimates that plumes visible during daytime hours would be less than 40 meters in length for 10 hours, between 40 and 100 meters in length for 18 hours, between 100 and 400 meters in length for 15 hours, and over 400 meters in length for 2 hours. The applicant has not estimated how many days each year that plumes may be visible.

The applicant estimates that visible plumes would form during the nighttime for 143 hours each year. However, the applicant has assumed that nighttime plumes would rarely be visible because lighting at the plant would be carefully controlled to minimize nighttime illumination and night time light levels in the vicinity of the proposed plant would be generally low. Also, the applicant states that meteorological conditions would reduce the overall visibility of the plumes because the plumes form under the same conditions that create fog and would therefore not be noticeable much of the time (Calpine/Bechtel 2000, p. 8.11-38).

An independent evaluation of visible plumes was conducted (Dunn pers. comm. 2000) to identify the appearance of visible plumes from the cooling tower. This assessment indicates that plumes from the cooling tower would occur and be highly visible during daytime hours for 5 percent of the time, or 219 hours each year. Plumes from the cooling tower that would occur 10 percent of the time, or 438 hours, during daytime hours each year also would be visible from KOPs to the south and east of the power plant. Based on this assessment, plumes from the cooling tower would occur and be visible for substantially more daytime hours each year than the applicant’s assessment indicates. In addition, this assessment indicates

that cooling tower plumes that would occur 10 percent of the time, or 438 hours, during nighttime hours each year would be substantially larger than cooling tower plumes that would occur 5 percent of the time each year during daytime hours.

The most substantial visual impacts from visible plumes would be for foreground views with moderately high to high visual sensitivity from residences, Monterey Road, the railroad, Coyote Ranch and Coyote Creek Trails, and Highway 101, which is a designated scenic route and highway. The plumes would be of the sizes shown in Figures 33 and 34 or larger for 10 percent and 5 percent, respectively, of the daytime hours and Figure 35 or larger for 10 percent of the nighttime hours in a given year.

Also, plumes would be visible in the middleground from a variety of other locations in the area from which plumes are not currently visible. In addition, if the Campus Industrial Area develops according to the master plan and guidelines, future views of plumes would be by high numbers of workers, visitors, and others with moderately high to high visual sensitivity. Although the ambient light level in the vicinity of the power plant site is currently low, some ambient light from natural and other sources in the area would be likely to illuminate nighttime plumes. Ambient light levels in the area are likely to increase as development occurs in the North Coyote Valley. For these reasons, it is likely that nighttime cooling tower plumes would be visible in a variety of views throughout the area under both current and likely future conditions.

As described above in the analyses of impacts of views from locations around the area, visible water vapor plumes would add new visual elements to views with moderately high to high visual sensitivity in an area that is currently rural and where views of plumes do not currently exist. The plumes would be visible in a given year for at least 219 daytime hours from numerous locations; 438 daytime hours from residences along Blanchard Road and from Monterey Highway, trains, and other locations south and east of the power plant; and 438 nighttime hours from a variety of locations. Visible plumes would contribute substantially to people's impression that the facility is industrial. When plumes are visible, intactness, unity, and vividness, and therefore visual quality, would be substantially reduced for views with moderately high to high visual sensitivity. In addition, the visual character of the area would be substantially changed from rural to industrial.

Because plumes of a substantial size would occur for a considerable amount of time and be highly visible to high numbers of people, visual sensitivity for numerous views of plumes is moderately high to high, plumes would be introduced in an area where they do not currently exist, and visible plumes would substantially reduce the visual quality and character of views of the project area, the visual impacts of visible plumes from the power plant would be significant.

Therefore, to reduce these impacts to less than significant levels, staff proposes implementation of Conditions of Certification VIS-3, for minimizing light and glare impacts, including illumination of plumes, and VIS-10, for minimizing visible plumes.

CUMULATIVE IMPACTS

The proposed power plant would be located in an area that is currently rural in character. The area is largely open space, consisting mostly of agricultural fields, grazed grasslands, rolling hills, and riparian areas, and includes a few rural homes and structures nearby. At least one major project is proposed to be constructed in the near future in the immediate vicinity of the proposed project site in the North Coyote Valley area. Several other projects would potentially be developed in the reasonably foreseeable future. Some of these projects would be located far enough from the proposed project that the cumulative visual impacts of these projects in combination with those of the proposed project would be minimal.

The Coyote Valley Research Park is proposed to be developed on 688 acres just south of the proposed power plant site. The area would extend from within 0.25 mile of the project site south to Bailey Avenue and from the railroad tracks on the west side of Monterey Road west to the base of the Santa Teresa Hills. A little over half of this area would be developed with campus industrial facilities, including research and development operations largely for high technology businesses. The remainder would be developed for storm water retention and detention and open space, mostly in the area west of Santa Teresa Boulevard. The campus industrial facilities would contain about 6.6 million square feet of floor space. Cisco Systems intends to develop its headquarters complex within the research park, creating approximately 20,000 jobs.

Lands south and east of the proposed research park are designated by the City as the Coyote Valley Urban Reserve. The City has stated that development of these lands for mixed residential and commercial uses could begin once development that would generate 5,000 jobs has begun for the campus industrial area. The research park would generate enough jobs to trigger the beginning of development of the urban reserve lands. The urban reserve lands are expected to contain business and commercial uses and up to 25,000 dwelling units.

In addition, several projects are proposed in the general vicinity of the proposed project that could have cumulative visual impacts. However, these projects are located far enough from the proposed project that the cumulative visual impacts of the project in combination with those of the proposed project would be minimal. These projects include the Stellex office and manufacturing project, located 4.25 miles north; the Hellyer View manufacturing and research and development facility, located 4.25 miles north; the Hellyer Vista View 1 manufacturing, research and development, and warehousing facility, located 4 miles north; the Creekside Plaza manufacturing, research and development, and warehousing facility, located 4 miles north; the Lincoln Property Company research and development facility, located 3.25 miles north; the Pepper Lane Properties research and development facility, located 2 miles north; and a 142-acre single-family residential development, located 1 mile north. Each of these proposed developments is located beyond the northern limit of the North Coyote Valley in areas that are generally more developed and less rural in character than the proposed project. Because they are not located within the project's affected visual character zone (i.e., the North Coyote Valley), their visual association with the proposed power plant would not be strong. For this

reason, the cumulative effects of the proposed power plant in combination with these proposed projects would be less than significant.

The proposed Coyote Valley Research Park project would include streets, parking lots, and buildings clustered at the centers of large parcels. Based on the guidelines for development of the campus industrial area, the research park project would be developed with building heights, masses, densities, landscaping, and other features that are intended to preserve the rural aesthetic characteristics of the area. However, the proposed Coyote Valley Research Park would substantially change the visual character of the North Coyote Valley from rural agricultural to urban and developed and the City of San Jose has identified this visual impact as significant and unavoidable (City of San Jose 2000c, p.184). In addition, development of the urban reserve area for high density residential, commercial, and other urban development uses would contribute to substantially changing the visual character of the North Coyote Valley from rural to more urban.

As described elsewhere in this section, the proposed power plant project would not entirely conform to the guidelines for development of the campus industrial area. The proposed power plant project would increase the number of structures in the area that would be visible in views from several locations with high visual sensitivity. The power plant structures would be taller and more massive than the design guidelines specify for development of the campus industrial area. Because of this, the power plant would be more noticeable than other structures developed as part of the research park.

For highly sensitive views of both the Coyote Valley Research Park and the Coyote Valley Urban Reserve projects, the effects would be to substantially change the visual character of the area from agricultural and rural to high quality campus industrial and residential. This could substantially reduce the intactness of views of the area, but may not substantially reduce the unity and vividness and therefore visual quality of existing views of the area.

Because the proposed power plant, Coyote Valley Research Park, and Coyote Valley Urban Reserve projects would each substantially change visual character and potentially substantially reduce visual quality for some views, the three projects would potentially produce significant visual impacts and the cumulative visual impacts of the three projects would also be significant. The proposed power plant project would contribute substantially to these significant cumulative visual impacts in the North Coyote Valley.

FACILITY CLOSURE

PLANNED CLOSURE

Planned closure occurs at the end of a project's life, when the facility is closed in an anticipated, orderly manner, at the end of its useful economic or mechanical life, or due to gradual obsolescence. The closure plan that the project owner is required to

prepare should address removal of the power plant structures and the transmission lines to reduce visual impacts.

UNEXPECTED TEMPORARY CLOSURE

Unexpected temporary closure occurs when the facility is closed suddenly and/or unexpectedly, on a short-term basis, due to unforeseen circumstances such as a natural disaster, or an emergency. No special conditions regarding visual resources are expected to be required to address temporary closure.

UNEXPECTED PERMANENT CLOSURE

Unexpected permanent closure occurs if the project owner closes the facility suddenly and/or unexpectedly, on a permanent basis. This includes unexpected closure where the owner remains accountable for implementing the on-site contingency plan. It can also include unexpected closure where the project owner is unable to implement the contingency plan, and the project is essentially abandoned. The contingency plan that the project owner is required to prepare should address removal of the power plant structures and the transmission lines to reduce visual impacts.

COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS, AND STANDARDS

This section assesses the proposed project's compliance with applicable laws, ordinances, regulations, and standards that affect visual resources. Additional laws, ordinances, regulations, and standards that affect the appearance of new facilities are identified in the Land Use section. Table Vis-3 is a summary of the proposed project's compliance with laws, ordinances, regulations, and standards.

Table Vis-3. Summary of Project Compliance with Laws, Ordinances, Regulations, and Standards

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)	COMPLIANCE WITH LORS
<i>City of San Jose, San Jose 2020 General Plan, Community Development/Urban Design</i>	
<p>11. Non-Residential building height should not exceed 45 feet except:</p> <p>In the North Coyote Valley and South Edenvale Areas designated for Campus Industrial Use, the maximum building height is 120 feet (p. 57).</p> <p>For public or quasi-public uses on properties in any area of the community with a Public/Quasi-Public designation, the maximum building height is 95 feet (p. 57).</p> <p>For structures, other than buildings, where substantial height is intrinsic to the function of the structures and where such structures are located to avoid significant adverse effects on adjacent properties, height limits may be established in the context of project review (p. 58).</p>	No
17. Development adjacent to creekside areas should incorporate compatible design and landscaping including plant species, which are native to the area or are compatible with native species (p. 60).	Yes
24. New development projects should include the preservation of ordinance-sized and other significant trees. Any adverse effect on the health and longevity of such trees should be avoided through appropriate design measures and construction practices. When tree preservation is not feasible, the project should include appropriate tree replacement (p. 60).	Yes
<i>Aesthetic, Cultural, and Recreational Resources/Scenic Routes</i>	
4. Any development occurring adjacent to Landscaped Throughways should incorporate interesting and attractive design qualities and promote a high standard of architectural excellence (p. 90).	Not applicable
6. Development along designated Rural Scenic corridors should preserve significant views of the Valley and mountains, especially in, or adjacent to, Coyote Valley, the Diablo Range, the Silver Creek Hills, the Santa Teresa Ridge, and the Santa Cruz Mountains (p. 90).	Yes
<p><i>Trails and Pathways</i></p> <p>1. The City should control land development along designated Trails and Pathway Corridors in order to provide sufficient trail right-of-way and ensure that new development adjacent to the corridors does not detract from the scenic and aesthetic qualities of the</p>	No

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)	COMPLIANCE WITH LORS
corridor (p. 91).	
<p><i>Riparian Corridors and Upland Wetlands Policies</i></p> <p>4. New development should be designed to protect adjacent riparian corridors from encroachment of lighting, exotic landscaping, noise and toxic substances into the riparian zone (p. 95).</p>	Yes
<p><i>Land Use/Transportation Diagram, Scenic Routes and Trails Diagram, Scenic Routes</i></p> <p>Permitted land uses in Rural Scenic Corridors should be limited to well landscaped campus industrial uses, single-family residences, agriculture, parks, trails, and other open space uses in order to preserve the natural scenic resources.</p>	No
<p>MASTER DEVELOPMENT PLAN AND GUIDELINES FOR THE NORTH COYOTE VALLEY CAMPUS INDUSTRIAL AREA, PUBLIC IMPROVEMENT GUIDELINES, Improvements and Jurisdiction</p>	
<p>Trees will be preserved whenever possible both on and in areas adjacent to the Campus Industrial Area (p. 26).</p>	Yes
<p>From the Urban Service Boundary to Tulare Hill: Plant 50-foot landscape area with groupings and groves of tall broadleaf evergreen trees, walnuts, native shrubs and groundcovers (p. 30).</p>	Yes
<p>Allow view “windows” to hills beyond (p. 30).</p>	Yes
<p><i>Landscape and Open Space</i></p> <p>The Landscape and Open Space diagram (p. 35) identifies the majority of the northern portion of the project site as riparian/parkway and indicates that uses should include retention/recreation.</p>	No
<p><i>Private Improvement Guidelines</i></p>	
<p>Retain, as much as possible, the views from roadways and developed areas to the hills that form the Valley. The preservation of such views is a major contribution to maintaining the rural character of the area (p. 58).</p>	Yes

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)	COMPLIANCE WITH LORS
Rural Building Massing Concept: Buildings will be set back from roadways far enough to permit views to the surrounding hills and to establish a rural pattern of buildings clustered at the centers of large sites (p. 59).	No
Building Edge: Vary the setback of buildings to increase visual interest. Break up building mass to allow views between buildings to surrounding landforms (p. 61).	Yes
Building Silhouette: Vary the building cluster silhouette and centralize the highest buildings to reinforce the concept of rural building massing (p. 62).	No
Building Height: Overall building height shall not exceed the height limitations set forth in Urban Design Policy #11 of the General Plan. (City of San Jose 1985, p. 62) [Note: The specific portion of policy #11 that the project does not comply with states: "For structures, other than buildings, where substantial height is intrinsic to the function of the structures and where such structures are located to avoid significant adverse effects on adjacent properties, height limits may be established in the context of project review." Although the elements of the project that would exceed the height limit appear to be intrinsic to the function of the power plant, the project is not located to avoid significant adverse effects on adjacent properties. Therefore, the project does not comply with this policy.]	No
Rooftop Equipment: Rooftop mechanical equipment should be consolidated within parapet walls which exceed the height of the equipment. Equipment enclosures should be integrated into the architectural design treatment of the building. Rooftop equipment should be hidden from view from hillsides and elevated entry roads into the valley (p. 63).	No
Flood Control Channel Edge: Development areas will be separated from the riparian landscape of the flood control channel by a 50 foot landscape easement. Native plant materials must be used to extend the landscape within this zone. Security fences will be screened by landscape within this easement (p. 67).	Yes
Adjacent Properties Edge: Adjacent properties will be separated by 15 feet of landscaping. Planting within these setbacks will be used to screen security fences (p. 68).	No
Monterey Highway: A 50 foot landscape easement will separate properties from the Southern Pacific right-of-way. Hedges will be used to separate buildings and railroad traffic. Security fences will occur on property lines. Building facades facing Monterey Highway should receive consistent architectural treatment. Service and storage areas must be totally screened from view at the time of construction (p. 69).	No

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)	COMPLIANCE WITH LORS
Major Entry Landscape: Major entrances to properties will be visually marked using tall trees. Typical street planting within the front landscape setback should be visually integrated with the landmark entrance landscape (p. 70).	No
Parking Lot Illumination: Maintain a uniform distribution of light throughout parking areas. Low-sodium fixtures must be used and maximum parking lot illumination shall not exceed .5 fc. Light sources should not be visible from streets. Luminaire height should be uniform over the parking area and should not exceed 15-20 feet. Fixtures should be visually compatible with the landscape treatment of the parking area. Pedestrian pathways should be illuminated separately to a maximum of 0.8 fc. Exterior flood lighting of buildings is prohibited (p. 72).	Yes, with implementation of Condition of Certification VIS-3
Building Landscape: The concept of rural building massing will be reinforced with tall and columnar trees to create a skyline landscape which will visually contrast with the surrounding orchard parking landscape. The central building grouping should be the most lush and ornamental planting area of each parcel (p. 73).	No
<p>General Development Plan Standards</p> <p>12. All truck loading docks, storage and service areas shall be screened from public view, and shall be located a minimum of 75 feet from any property line. In no case shall such docks, storage or service area be visible from any public street or from Fisher Creek (p. 86).</p>	Yes
Riparian Corridor Policy Study	
<p>Chapter 1: Riparian Corridor Policies and Related Programs</p> <p>Relationship to Horizon 2000 General Plan</p> <p>Trails and Pathways</p> <p>1. The City should control land development along designated Trails and Pathway Corridors in order to provide sufficient trail right-of-way and ensure that new development adjacent to the corridors does not detract from the scenic and aesthetic qualities of the corridor (p. 7).</p>	No
Chapter 3: Riparian Corridor Development Guidelines	Yes

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)	COMPLIANCE WITH LORS
<p>Site Design</p> <p>Guideline 1A: Orientation Site activities should be oriented to draw activity away from the riparian corridor, for example, entrances, loading and delivery areas, noise generating activities and equipment, and activities requiring night lighting should be oriented toward non-riparian property edges (p. 30).</p>	
<p>2. Building and Fixture Design</p> <p>Guideline 2A: Building Appearance In riparian forest settings located in more rural or suburban areas of the city, building facades should blend visually with the surrounding natural landscape. The colors of buildings should generally be of darker earth tones (e.g., brown, tan, gray, or greens); the use of bright colors and glossy finishes are discouraged (p. 41).</p>	No
<p>Guideline 2B: Glare Building materials should not produce glare that would adversely impact the riparian corridor. Windows should not be mirrored but otherwise their use is not limited (p. 41).</p>	Yes
<p>Guideline 2C: Visual The adverse visual impact of existing or unavoidable incompatible uses such as parking areas, loading zones, trash enclosures, mechanical devices, and similar accessory uses should be minimized by landscaping, hedging, berming, low walls, and site design. Rooftop equipment should be screened from view from any riparian corridor trail or recreational, educational, or interpretive facilities within the riparian corridor (p. 41).</p>	No
<p>Guideline 2D: Signs Signs associated with land uses that are adjacent to the riparian corridor and that are not related to complementary recreational or public safety services should be oriented away from the riparian corridor to avoid impacting recreational users of the corridor, or attracting otherwise unnecessary access and activity (p. 42).</p>	Yes
<p>Guideline 2E: Lighting All trail corridors, except for the Guadalupe River Downtown, are closed after sunset, and as such do not have lighting (except for security lighting at bridge under-crossings). For all other</p>	Yes, with implementation of Condition of Certification VIS-3.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)	COMPLIANCE WITH LORS
developments, lighting within the corridor and setback areas should be avoided. Lighting on development sites should be designed and sited to avoid light and glare impacts to wildlife within the riparian corridor, consistent with public safety considerations. Any lighting located adjacent to riparian areas should be as low as feasible in height (bollard lighting is preferred) and must be directed downward with light sources not visible from riparian areas (p. 42).	
Parking lot lighting near a riparian edge (e.g., with minimum setbacks from the corridor) should be avoided if nighttime use of that portion of the parking lot is unlikely (p. 42).	Yes.
<p>Landscaping</p> <p>Guideline 3A: Development Landscaping</p> <p>Landscaping of areas adjacent to the riparian corridor should generally utilize plant species native to central California and appropriate to the riparian habitat type of the corridor. In some areas, remnant riparian species (e.g., remnant sycamore, and valley oak trees) exist outside the mapped riparian corridor. These species should be retained in the development plan. Non-native species may not be planted within the riparian corridor, and invasive exotics should not be used in landscaping within 100 feet of a riparian corridor. Refer to Appendix B for lists of plant species suitable and unsuitable for revegetation within riparian corridors and in riparian setback areas. Refer also to any applicable master landscape plans for landscape requirements (p. 42).</p>	Yes.
<p>Guideline 3B: Irrigation</p> <p>Irrigation systems within 100 feet of riparian areas should be designed to avoid negative impacts to riparian environment conditions (p. 42).</p>	Yes.
<p>SAN JOSE ZONING ORDINANCE</p> <p>The applicability of the San Jose zoning ordinance to the project is in the Land Use section of this Preliminary Staff Assessment.</p>	
SANTA CLARA COUNTY , SANTA CLARA COUNTY GENERAL PLAN	
<p>R-LU 73</p> <p>The County's major gas and electric distribution system should be ... compatible with the environmental resources and scenic qualities of the County.</p>	Yes.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)	COMPLIANCE WITH LORS
<ul style="list-style-type: none"> ▪ R-LU 74 ▪ In locating major gas and electric transmission distribution facilities, the primary environmental considerations shall be to minimize aesthetic impacts and to avoid developed residential and/or public recreation areas. Major electric transmission lines should be located and designed in accordance with the following principles: <ul style="list-style-type: none"> ▪ Route selection should avoid ridgelines and follow the natural flow and rhythm of landforms as much as possible. ▪ Routes should not cross scenic roads at points where lines will be visible for long distances. ▪ Minimum height structures should be used to reduce visual impacts where the additional structures which result are not objectionable. ▪ Vegetation should be used for screening where it will not interfere with a facility's operation. ▪ Design, appearance, and paint selection should reduce visual impact. 	Yes.
<p>R-LU 75</p> <p>Electric substations and gas control metering stations shall be located, designed, and landscaped to fit as inconspicuously and harmoniously as possible into the area in which they are required. Locations along scenic roads and heavily traveled highways should be avoided.</p>	No.
<p>R-RC 97</p> <p>Scenic qualities of the rural areas of Santa Clara County shall be maintained and enhanced through existing land use and development policies. Development compatible with scenic resource conservation should be encouraged.</p> <p>C-PR 37</p> <p>The natural scenery along many of Santa Clara County's highways should be protected from land uses and other activities which would diminish its aesthetic beauty.</p> <p>C-PR 38</p> <p>Land use should be controlled along scenic roads so as to relate to the location and functions of these roads and should be subject to design review and conditions to assure the scenic quality of the corridor.</p> <p>C-PR 39</p>	Yes.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)	COMPLIANCE WITH LORS
<p>The visual integrity of the scenic gateways to the South County (.... Coyote greenbelt area north of Morgan Hill) should be protected.</p> <p>C-GD 17</p> <p>Planning for Coyote Valley's future development should provide for: c. protection of a scenic corridor along Highway 101.</p>	

FEDERAL AND STATE

The proposed project, including the linear facilities, is located on private lands and is not subject to federal or state land management requirements. Likewise, no roadway in the project vicinity is a designated or eligible State Scenic Highway. Therefore, the project is not subject to any federal or state regulations pertaining to visual resources.

LOCAL

All portions of the proposed project would be variously located in the City of San Jose and Santa Clara County. Therefore, the project will be subject to the applicable laws, ordinances, regulations, and standards relevant to visual resources for those portions of the project within their jurisdictional boundaries. The power plant would be located on a site that is partially in the City and partially in the County and within the Sphere of Influence of the City. The northern portion of the site is in the County and the southern portion is in the City. Linear facilities also would be located in the City and the County. The northern portion of the proposed 200-foot-long electric transmission line from the plant to an existing transmission tower and portions of proposed water, sewer, and gas lines would be in the County. Also, a gas metering station would be located east of and near Highway 101 in the County. All other elements of the proposed project would be in the City of San Jose. Applicable laws, ordinances, regulations, and standards are identified below and are from the *San Jose 2020 General Plan* (City of San Jose 1994b), *San Jose Zoning Ordinance* (City of San Jose 1997), *Master Development Plan and Guidelines for the North Coyote Valley Campus Industrial Area* (City of San Jose 1985), and *Santa Clara County General Plan* (Santa Clara County 1994).

CITY OF SAN JOSE

SAN JOSE 2020 GENERAL PLAN

The project's compliance with the policies contained in the San Jose 2020 General Plan (City of San Jose 1994b) that apply to protecting and maintaining visual resources is described below. Relevant policies are from the Community Development/Urban Design Element; Aesthetic, Cultural, and Recreational Resources/Scenic Routes Element; and the Land Use/Transportation Diagram, Scenic Routes and Trails Diagram, Scenic Routes.

Community Development/Urban Design

11. Non-Residential building height should not exceed 45 feet except:

In the North Coyote Valley and South Edenvale Areas designated for Campus Industrial Use, the maximum building height is 120 feet (p. 57).

For public or quasi-public uses on properties in any area of the community with a Public/Quasi-Public designation, the maximum building height is 95 feet (p. 57).

For structures, other than buildings, where substantial height is intrinsic to the function of the structures and where such structures are located to avoid significant adverse effects on adjacent properties, height limits may be established in the context of project review (p. 58).

The applicant has submitted an application to the City for annexation of the northern portion of the project site and rezoning the entire site as Public/Quasi-Public. Because the City would require that the site be zoned as Public/Quasi-Public, the City's general plan requirements for this zone are applicable. In addition, the project site is located within the area designated for development of the North Coyote Valley Campus Industrial Area (City of San Jose 1985). The City has clarified that the standards and guidelines identified within the master development plan for this area are "applicable for any and all development in North Coyote Valley regardless of the General Plan designation" (City of San Jose 2000a, p. 6). The City has further stated that the master development plan is "intended to guide the development of a world-class research/technology park in keeping with the City's longstanding economic development goals" and this plan "goes beyond development standards to articulate the character of this planned, high-quality, campus industrial area" (City of San Jose 2000a, p. 6). Therefore, it is appropriate to consider that the standards of both the Public/Quasi-Public designation and the North Coyote Valley Campus Industrial Area are applicable for this proposed project.

The two most prominent elements of the project (i.e., the two HRSG stacks) would be 145 feet high, substantially exceeding the existing height limits identified for both the Public/Quasi-Public and the Campus Industrial Area designations (i.e., 95 feet and 120 feet respectively). Other elements of the proposed power plant that would exceed the established height limit for the Public/Quasi-Public designation include the steel top works which consist of an array of horizontal boiler drums, crossover pipes, steel support framework, cylinder-shaped silencers, and boiler steam vents. These steel top works extend above the 95-foot-high HRSG screening structures to a height of 122 feet. The applicant has stated that the screened HRSG units and other elements of the power plant have been limited to a maximum of 95 feet in order to adhere to the height limit for the Public/Quasi-Public designation.

Although the HRSG stacks and top works would be intrinsic to the function of the power plant, the analysis of visual impacts of the proposed project indicates that the power plant has the potential for significant adverse effects on adjacent properties. Because of this, it appears that the height limits identified above would apply to the

proposed project. For these reasons, it appears that the proposed project would conflict with the City's policies for established height limits.

17. Development adjacent to creekside areas should incorporate compatible design and landscaping including plant species, which are native to the area or are compatible with native species (p. 60).

Based on the preliminary landscape plan for the proposed project, dated July 18, 2000, the proposed project would comply with this policy.

24. New development projects should include the preservation of ordinance-sized and other significant trees. Any adverse effect on the health and longevity of such trees should be avoided through appropriate design measures and construction practices. When tree preservation is not feasible, the project should include appropriate tree replacement (p. 60).

Based on the configuration of the elements of the proposed power plant as it has been designed, it would not be feasible to retain the ordinance-sized and other significant trees that comprise the central grove of walnut and valley oak trees on the site. The applicant has stated that it will not be feasible to retain all of the trees now growing on the project site and has proposed a planting plan that shows extensive tree planting to compensate for the loss of trees. For these reasons, the proposed project would not conflict with this policy for preserving ordinance-sized and other significant trees.

Aesthetic, Cultural, and Recreational Resources/Scenic Routes

5. Any development occurring adjacent to Landscaped Throughways should incorporate interesting and attractive design qualities and promote a high standard of architectural excellence (p. 90).

The proposed project is approximately 2,400 feet from Highway 101, which is designated as a Landscaped Throughway. Because of its distance, the project would not be considered adjacent to the highway. For this reason, this policy does not apply to the proposed project.

6. Development along designated Rural Scenic corridors should preserve significant views of the Valley and mountains, especially in, or adjacent to, Coyote Valley, the Diablo Range, the Silver Creek Hills, the Santa Teresa Ridge, and the Santa Cruz Mountains (p. 90).

The proposed project is approximately 2,400 feet from Highway 101, which is designated as a Rural Scenic route. Although the proposed project is not adjacent to the highway, it is within the foreground distance zone of the highway and easily visible from it. For this reason, the project would be within the scenic corridor of the highway. Based on the visual analysis in this section, the proposed project would not substantially reduce the overall visual quality of views from the highway. For this reason, the proposed project would comply with this policy.

Trails and Pathways

1. The City should control land development along designated Trails and Pathway Corridors in order to provide sufficient trail right-of-way and ensure that new development adjacent to the corridors does not detract from the scenic and aesthetic qualities of the corridor (p. 91).

The discussion above in the section “Project Specific Impacts” identifies that, for likely future conditions, the proposed project would produce substantial visual impacts for views from the designated trail corridor along Fisher Creek. The discussion further identifies that dense plantings along the trail proposed by the applicant to screen views of the power plant would create substantial residual visual impacts. Based on this conclusion, the proposed project would detract from the scenic and aesthetic qualities of the corridor and therefore it would not comply with this policy.

Riparian Corridors and Upland Wetlands Policies

4. New development should be designed to protect adjacent riparian corridors from encroachment of lighting, exotic landscaping, noise and toxic substances into the riparian zone (p. 95).

The discussion above in the section on Lighting in “Project Specific Impacts “ identifies that the proposed project has the potential to produce significant adverse visual impacts by introducing new sources of substantial light or glare in a location that currently has very low light levels and that, with implementation of the applicant’s proposed mitigation measures and Condition of Certification VIS-3, these potential significant adverse visual impacts would be less than significant. Based on this conclusion, the proposed project would comply with this policy.

Land Use/Transportation Diagram, Scenic Routes and Trails Diagram, Scenic Routes

Permitted land uses in Rural Scenic Corridors should be limited to well landscaped campus industrial uses, single-family residences, agriculture, parks, trails, and other open space uses in order to preserve the natural scenic resources.

The proposed project is within the foreground distance zone of Highway 101 and easily visible from it. For this reason, the project would be within the scenic corridor of the highway. Although the proposed project does not substantially reduce the visual quality of views from Highway 101, it also does not adhere to the guidelines for aesthetics and visual character for development within the Campus Industrial Area as described below. The proposed project has the appearance of an industrial facility which does not adhere to the types or visual character of land uses permitted or desirable within Rural Scenic Corridors. Because the proposed project does not fit the description of a campus industrial use or the other permitted land uses, it would not comply with this policy.

MASTER DEVELOPMENT PLAN AND GUIDELINES FOR THE NORTH COYOTE VALLEY CAMPUS INDUSTRIAL AREA

The proposed project lies within the area designated by the City of San Jose as the North Coyote Valley Campus Industrial Area. The plan and guidelines state that "The Guidelines set forth the desired overall perceptual quality of the Development Plan and its elements. They provide written and graphic indications as to size, form, scale and basic organization of the individual private parcels and public open space in a hierarchy of purpose and unity" (City of San Jose 1985, p. 20). The City of San Jose amended the master plan and guidelines in November 1999 to change some private improvement guidelines for campus size, building height, setbacks, parking, and other items. The City intends to make additional comprehensive changes to the master plan and guidelines and seek City Council approval for this comprehensive update in the spring of 2000 (City of San Jose 1999b).

Numerous guidelines contained within the current master plan provide direction for developing and maintaining a high level of aesthetic quality and preserving the "present rural aspect of the area." The proposed comprehensive update is intended to further reinforce and clarify standards for unique and high quality campus development in North Coyote Valley that gives the valley a "unique identity" and "preserves much of the natural features of the area" (City of San Jose 2000b). The following guidelines contained within the current plan (City of San Jose 1985) are representative of guidelines applicable to visual resources.

Public Improvement Guidelines

Improvements and Jurisdiction

Trees will be preserved whenever possible both on and in areas adjacent to the Campus Industrial Area (p. 26).

The applicant has stated that it will not be feasible to retain all of the trees now growing on the project site and has proposed a planting plan that shows extensive tree planting to compensate for the loss of trees. Based on the configuration of the elements of the proposed power plant as it has been designed, it would not be possible to retain the significant trees that comprise the central grove of walnut and valley oak trees on the site. For these reasons, the proposed project would not conflict with this policy for preserving trees whenever possible on and in areas adjacent to the Campus Industrial Area.

From the Urban Service Boundary to Tulare Hill:

Plant 50-foot landscape area with groupings and groves of tall broadleaf evergreen trees, walnuts, native shrubs and groundcovers (p. 30).

The project would border public improvement areas along Fisher Creek on the west and north. Based on the preliminary landscape plan, dated July 18, 2000, the proposed project would comply with this policy.

Allow view “windows” to hills beyond (p. 30).

The plan and guidelines do not clearly define what is meant by “view ‘windows’”. Because the proposed project would not fully block views of surrounding hills from most areas around the site, it appears that the project would comply with this policy.

Landscape and Open Space

The Landscape and Open Space diagram (p. 35) identifies the majority of the northern portion of the project site as riparian/parkway and indicates that uses should include retention/recreation.

The proposed project would establish uses other than riparian/parkway and retention/recreation on the majority of the northern portion of the project site. Because of this, the visual character and quality generally associated with these land uses would not be established on the majority of the northern portion of the site as shown on the diagram. For this reason, the proposed project would not comply with the intent of the Landscape and Open Space diagram for this area to have the visual character and quality of riparian/parkway open space. Therefore, the proposed project would not comply with this guideline in the plan.

Private Improvement Guidelines

Retain, as much as possible, the views from roadways and developed areas to the hills that form the Valley. The preservation of such views is a major contribution to maintaining the rural character of the area (p. 58).

Because the proposed project would not substantially block views of surrounding hills from roadways and developed areas, it would comply with this policy.

Rural Building Massing Concept: Buildings will be set back from roadways far enough to permit views to the surrounding hills and to establish a rural pattern of buildings clustered at the centers of large sites (p. 59).

The structures of the proposed project appear to be setback from roadways far enough to permit views of the surrounding hills and they are primarily located in the central portion of the site. However, the heights and masses of the structures appear to exceed those described and diagramed in the guidelines identified for the Campus Industrial Area. For these reasons, the proposed project does not appear to establish the rural pattern of buildings described and illustrated in the plan for the area. Therefore, the proposed project would not comply with this guideline in the plan.

Building Edge: Vary the setback of buildings to increase visual interest. Break up building mass to allow views between buildings to surrounding landforms (p. 61).

The structures of the proposed project are set back varying distances from roadways and site boundaries. The structures appear massive and bulky in most views; however, the building masses are broken up enough to permit views of the

surrounding landforms. Therefore, the proposed project would comply with this guideline in the plan.

Building Silhouette: Vary the building cluster silhouette and centralize the highest buildings to reinforce the concept of rural building massing (p. 62).

The structures of the proposed project appear to be clustered with the highest structures positioned in the central portion of the site. However, the heights and masses of the structures appear to exceed those described and diagramed in the guidelines for the Campus Industrial Area. For these reasons, the proposed project does not appear to reinforce the concept of rural building massing described and illustrated in the plan for the area. Therefore, the proposed project would not comply with this guideline in the plan.

Building Height: Overall building height shall not exceed the height limitations set forth in Urban Design Policy #11 of the General Plan (City of San Jose 1985, p. 62).

The two most prominent elements of the project (the two HRSG stacks) substantially exceed the existing height limits identified for both the Public/Quasi-Public and the Campus Industrial Area designations. These two elements would be 145 feet high. Other elements of the proposed power plant that would exceed the established height limit for the Public/Quasi-Public designation include the steel top works which consist of an array of horizontal boiler drums, crossover pipes, steel support framework, cylinder-shaped silencers, and boiler steam vents. These steel top works extend above the 95-foot-high HRSG screening structures to a height of 122 feet. The applicant has stated that the screened HRSG units and other elements of the power plant have been limited to a maximum of 95 feet in order to adhere to the height limit for the Public/Quasi-Public designation.

Although the HRSG stacks and top works would be intrinsic to the function of the power plant, the analysis of visual impacts of the proposed project indicates that the power plant has the potential for significant adverse effects on adjacent properties. Because of this, it appears that the height limits identified above would apply to the proposed project. For these reasons, it appears that the proposed project would not comply with the City's policies for established height limits.

Rooftop Equipment: Rooftop mechanical equipment should be consolidated within parapet walls which exceed the height of the equipment. Equipment enclosures should be integrated into the architectural design treatment of the building. Rooftop equipment should be hidden from view from hillsides and elevated entry roads into the valley (p. 63).

The steel top works on the HRSG structures consist of an array of horizontal boiler drums, crossover pipes, steel support framework, cylinder-shaped silencers, and boiler steam vents. These top works have the appearance of and would be considered to be rooftop equipment. The top works extend above the 95-foot-high HRSG screening structures to a height of 122 feet and would be visible from a variety of locations, including hillsides and entry roads into the valley. The top

works are not consolidated within parapet walls and are not screened from view. For these reasons, the project would not comply with this policy.

Flood Control Channel Edge: Development areas will be separated from the riparian landscape of the flood control channel by a 50 foot landscape easement. Native plant materials must be used to extend the landscape within this zone. Security fences will be screened by landscape within this easement (p. 67).

Because the proposed project includes additional plantings of native riparian trees within the 100-foot setback area between Fisher Creek and the security fence around the west and north edges of the facility, it would comply with this policy.

Adjacent Properties Edge: Adjacent properties will be separated by 15 feet of landscaping. Planting within these setbacks will be used to screen security fences (p. 68).

The proposed project includes landscaping that is greater than 15 feet in width along most of the south side of the project. However, the landscaping strip shown on the preliminary landscape plan dated July 18, 2000 does not appear to fully extend along the edge of the property at the drainage detention basin. The plan shows future orchard trees would be installed on the adjacent property if the adjacent property is developed for campus industrial use. The security fence is located south of the landscape strip and is not screened from the adjacent property by the planting. Also, the west access road (not shown on the July 18, 2000 preliminary landscape plan) to be located south of the fence appears to be located where future orchard trees are shown on the preliminary landscape plan and is not screened from the adjacent property to the south. For these reasons, the proposed project does not comply with this policy.

Monterey Highway: A 50 foot landscape easement will separate properties from the Southern Pacific right-of-way. Hedges will be used to separate buildings and railroad traffic. Security fences will occur on property lines. Building facades facing Monterey Highway should receive consistent architectural treatment. Service and storage areas must be totally screened from view at the time of construction (p. 69).

The preliminary landscape plan dated July 18, 2000 shows a hedge along the east edge of the property and a security fence located on the property line. However, the proposed project does not include a 50-foot landscape easement separating it from the Southern Pacific right-of-way. Therefore, the proposed project does not comply with this policy.

Major Entry Landscape: Major entrances to properties will be visually marked using tall trees. Typical street planting within the front landscape setback should be visually integrated with the landmark entrance landscape (p. 70).

The preliminary landscape plan dated July 18, 2000 does not show tall trees visually marking the entry to the proposed project. Instead, the plan shows orchard trees extending south along the entry road from the power plant and ending about

100 feet north of Blanchard Road. For these reasons, the proposed project does not comply with this policy.

Parking Lot Illumination: Maintain a uniform distribution of light throughout parking areas. Low-sodium fixtures must be used and maximum parking lot illumination shall not exceed .5 fc. Light sources should not be visible from streets. Luminaire height should be uniform over the parking area and should not exceed 15-20 feet. Fixtures should be visually compatible with the landscape treatment of the parking area. Pedestrian pathways should be illuminated separately to a maximum of .8 fc. Exterior flood lighting of buildings is prohibited (p. 72).

The applicant has not submitted specific information on the lighting plan or lighting levels for the project. However, the applicant has proposed measures to reduce these visual impacts (see "Applicant's Proposed Mitigation Measures") and Energy Commission staff has expanded on these measures in a proposed condition of certification (see below). With implementation of the applicant's mitigation measures and Condition of Certification VIS-3, the proposed project would comply with this policy.

Building Landscape: The concept of rural building massing will be reinforced with tall and columnar trees to create a skyline landscape which will visually contrast with the surrounding orchard parking landscape. The central building grouping should be the most lush and ornamental planting area of each parcel (p. 73).

Based on the preliminary landscape plan for the proposed project, dated July 18, 2000, the primary tall trees would be coast redwoods that would be located in a double row near the south edge of the site. Although coast redwoods may be suitable for this area, they are not one of the trees specifically identified in the plant lists of appropriate plants for use within the campus industrial area. The row of trees would not be positioned near the central building grouping. This row of trees is intended to form a tall screen that would eventually help to block views of the lower portions of the tallest structures of the project from the south. Figure Vis-22 shows the appearance of an earlier version of the proposed project with the intended landscape treatment after 20 years. Figure Vis-20 shows the appearance of the proposed project viewed from the south after 5 years. Figure Vis-32 from the plan and guidelines illustrates the concept described for creating a skyline landscape with lush and ornamental planting near the central building grouping. Based on the description and diagrams in the plan, the proposed landscape plan for the project would not achieve the intent of this guideline to reinforce the rural building massing. For these reasons, the proposed project would not comply with this guideline.

General Development Plan Standards

12. All truck loading docks, storage and service areas shall be screened from public view, and shall be located a minimum of 75 feet from any property line. In no case shall such docks, storage or service area be visible from any public street or from Fisher Creek (p. 86).

The site plan for the proposed project does not show truck loading docks, storage, or service areas located within public view, within view of any public street or Fisher Creek, or within 75 feet of any property line. For these reasons, the proposed project would comply with this guideline.

RIPARIAN CORRIDOR POLICY STUDY

The following policies and guidelines are from the City's Riparian Corridor Policy Study (1994a) and are intended to preserve and enhance the visual character and quality of the corridors of the City's major waterways. The project's compliance with these policies and guidelines is described below.

Chapter 1: Riparian Corridor Policies and Related Programs

Relationship to Horizon 2000 General Plan

Trails and Pathways

1. The City should control land development along designated Trails and Pathway Corridors in order to provide sufficient trail right-of-way and ensure that new development adjacent to the corridors does not detract from the scenic and aesthetic qualities of the corridor (p. 7).

Compliance with this policy is described above under Trails and Pathways in the section San Jose 2020 General Plan.

The discussion above in the section "Project Specific Impacts" identifies that, for likely future conditions, the proposed project would produce substantial visual impacts for views from the designated trail corridor along Fisher Creek. The discussion further identifies that dense plantings along the trail proposed by the applicant to screen views of the power plant would create substantial residual visual impacts. Based on this conclusion, the proposed project would detract from the scenic and aesthetic qualities of the corridor and therefore it would not comply with this policy.

Chapter 3: Riparian Corridor Development Guidelines

Site Design

Guideline 1A: Orientation

Site activities should be oriented to draw activity away from the riparian corridor, for example, entrances, loading and delivery areas, noise generating activities and equipment, and activities requiring night lighting should be oriented toward non-riparian property edges (p. 30).

For the proposed project, site activities such as entrances, loading and delivery areas, and activities requiring night lighting appear to be oriented away from the riparian corridor and toward non-riparian property edges. For this reason, the proposed project would comply with this policy.

2. Building and Fixture Design

Guideline 2A: Building Appearance

In riparian forest settings located in more rural or suburban areas of the city, building facades should blend visually with the surrounding natural landscape. The colors of buildings should generally be of darker earth tones (e.g., brown, tan, gray, or greens); the use of bright colors and glossy finishes are discouraged (p. 41).

For the proposed project, the buildings would be massive and would appear out of scale with their surroundings. The building facades near the riparian corridor, notably the cooling tower, would present a tall, long, and massive wall to future viewers that would use the intended trails along the creek corridor. The applicant has stated that some views would be at least partially screened and colors and materials for structures near or visible from the riparian corridor would be consistent with the intent of this policy. However, for intermittent but long duration views by future recreationists who would use the riparian corridor and others who would have views of the riparian corridor and the power plant from other nearby locations, the tall and massive building facades would not appear to blend visually with the surrounding natural landscape. For this reason, the proposed project would not comply with this policy.

Guideline 2B: Glare

Building materials should not produce glare that would adversely impact the riparian corridor. Windows should not be mirrored but otherwise their use is not limited (p. 41).

For the proposed project, none of the buildings facing the riparian corridor would have window glass or have finishes that would produce glare. For this reason, the proposed project would comply with this policy.

Guideline 2C: Visual

The adverse visual impact of existing or unavoidable incompatible uses such as parking areas, loading zones, trash enclosures, mechanical devices, and similar accessory uses should be minimized by landscaping, hedging, berming, low walls, and site design. Rooftop equipment should be screened from view from any riparian corridor trail or recreational, educational, or interpretive facilities within the riparian corridor (p. 41).

For the proposed project, parking areas, loading zones, and trash enclosures would not be located where they would be easily seen from the riparian corridor or they would be screened from view by dense vegetation. Some structures and accessory uses, including the retention basin, switching station, and cooling towers may be visible from some locations within the riparian corridor. Also, the top works on the HRSG structures, which would be considered to be rooftop equipment, may be visible from some locations within the riparian corridor. Although the applicant has stated that views of these elements from the riparian corridor would be effectively screened, it is not clear that all views of these elements from within the riparian

corridor would be screened or that it would be desirable to provide this level of screening throughout the corridor. For these reasons, the project has the potential to not comply with this policy.

Guideline 2D: Signs

Signs associated with land uses that are adjacent to the riparian corridor and that are not related to complementary recreational or public safety services should be oriented away from the riparian corridor to avoid impacting recreational users of the corridor, or attracting otherwise unnecessary access and activity (p. 42).

For the proposed project, no signs, other than those necessary for safety and security, would be placed in proximity to the riparian corridor where they would be easily visible. For this reason, the proposed project would comply with this policy.

Guideline 2E: Lighting

All trail corridors, except for the Guadalupe River Downtown, are closed after sunset, and as such do not have lighting (except for security lighting at bridge under-crossings). For all other developments, lighting within the corridor and setback areas should be avoided. Lighting on development sites should be designed and sited to avoid light and glare impacts to wildlife within the riparian corridor, consistent with public safety considerations. Any lighting located adjacent to riparian areas should be as low as feasible in height (bollard lighting is preferred) and must be directed downward with light sources not visible from riparian areas (p. 42).

For the proposed project, no lighting would be located in the riparian corridor. Lighting proposed as part of the project, primarily for safety and security, may be visible from within the corridor. Because of this, the project has the potential to conflict with this policy. However, the applicant has stated that lighting impacts would be minimized through screening, shielding, and the use of timers, sensors, non-glare fixtures, directional lighting, and similar techniques for minimizing impacts of lighting. With implementation of the applicant's mitigation and Condition of Certification VIS-3, the proposed project would comply with this policy.

Parking lot lighting near a riparian edge (e.g., with minimum setbacks from the corridor) should be avoided if nighttime use of that portion of the parking lot is unlikely (p. 42).

No parking lot lighting would be located near the riparian corridor. For this reason, the proposed project would comply with this policy.

3. Landscaping

Guideline 3A: Development Landscaping

Landscaping of areas adjacent to the riparian corridor should generally utilize plant species native to central California and appropriate to the riparian habitat type of the corridor. In some areas, remnant riparian species (e.g., remnant sycamore, and

valley oak trees) exist outside the mapped riparian corridor. These species should be retained in the development plan. Non-native species may not be planted within the riparian corridor, and invasive exotics should not be used in landscaping within 100 feet of a riparian corridor. Refer to Appendix B for lists of plant species suitable and unsuitable for revegetation within riparian corridors and in riparian setback areas. Refer also to any applicable master landscape plans for landscape requirements (p. 42).

The proposed project identifies planting consistent with this policy. For this reason, the proposed project would comply with this policy.

Guideline 3B: Irrigation

Irrigation systems within 100 feet of riparian areas should be designed to avoid negative impacts to riparian environment conditions (p. 42).

The proposed project identifies that the use of irrigation would be consistent with this policy. For this reason, the proposed project would comply with this policy.

SAN JOSE ZONING ORDINANCE

The applicability of the San Jose zoning ordinance to the project is discussed in the Land Use section of this Final Staff Assessment.

SANTA CLARA COUNTY

SANTA CLARA COUNTY GENERAL PLAN

Portions of the proposed project, including linear elements and the northern portion of the power plant site, would be located on lands under the jurisdiction of Santa Clara County. The project's compliance with policies of the Santa Clara County General Plan (1994) that pertain to visual resources is described below. Policies are for rural unincorporated areas (R) in the categories of land use (LU) and resource conservation (RC) and countywide issues and policies (C) in the categories of parks and recreation (PR) and growth and development (GD).

R-LU 73

The County's major gas and electric distribution system should be ... compatible with the environmental resources and scenic qualities of the County.

R-LU 74

In locating major gas and electric transmission distribution facilities, the primary environmental considerations shall be to minimize aesthetic impacts and to avoid developed residential and/or public recreation areas. Major electric transmission lines should be located and designed in accordance with the following principles:

- Route selection should avoid ridgelines and follow the natural flow and rhythm of landforms as much as possible.

- Routes should not cross scenic roads at points where lines will be visible for long distances.
- Minimum height structures should be used to reduce visual impacts where the additional structures which result are not objectionable.
- Vegetation should be used for screening where it will not interfere with a facility's operation.
- Design, appearance, and paint selection should reduce visual impact.

The proposed gas lines are underground and with implementation of Condition of Certification VIS-4, their visual impacts would be less than significant. The proposed transmission line would run approximately 200 feet north from the proposed project across the riparian corridor of Fisher Creek and connect to an existing transmission tower. Only the lines would be placed and no new structures would be constructed. Although the lines would be noticeable from Monterey Road and the riparian corridor, their visual impacts would be minimal. For these reasons, the proposed gas lines and transmission line would comply with the above policies.

R-LU 75

Electric substations and gas control metering stations shall be located, designed, and landscaped to fit as inconspicuously and harmoniously as possible into the area in which they are required. Locations along scenic roads and heavily traveled highways should be avoided.

A gas metering station is proposed to be located along the east side of Highway 101, a heavily-traveled County-designated scenic highway. Visual impacts of the gas metering station are described above in the section "Project Specific Impacts." With implementation of proposed mitigation measures by the applicant and Condition of Certification VIS-8, the gas metering station would "fit as inconspicuously and harmoniously as possible into the area." However, because the gas metering station does not avoid its location along a heavily traveled and designated scenic highway, it does not comply with this policy.

R-RC 97

Scenic qualities of the rural areas of Santa Clara County shall be maintained and enhanced through existing land use and development policies. Development compatible with scenic resource conservation should be encouraged.

C-PR 37

The natural scenery along many of Santa Clara County's highways should be protected from land uses and other activities which would diminish its aesthetic beauty.

C-PR 38

Land use should be controlled along scenic roads so as to relate to the location and functions of these roads and should be subject to design review and conditions to assure the scenic quality of the corridor.

C-PR 39

The visual integrity of the scenic gateways to the South County (.... Coyote greenbelt area north of Morgan Hill) should be protected.

C-GD 17

Planning for Coyote Valley's future development should provide for: c. protection of a scenic corridor along Highway 101.

Highway 101 is designated as a county scenic highway. This portion of the highway is also recognized as an important gateway into the county from the south. The rural character and scenic importance of the Coyote Valley are recognized by both the county and city. The proposed project is within the foreground distance zone of the highway and easily visible from it. For this reason, the project would be within the scenic corridor of the highway. Based on the visual analysis in this section, the proposed project would not substantially reduce the overall visual quality of views from the highway. For this reason, the proposed project would comply with the county policies identified above.

RESPONSE TO PUBLIC AND AGENCY COMMENTS

Responses to comments on the PSA from the public and agencies are provided below.

AGENCY COMMENTS

DEPARTMENT OF PLANNING, BUILDING AND CODE ENFORCEMENT, CITY OF SAN JOSE

Visible Plume

The City of San Jose states that "there should be no visible plumes at any time during the plant's operation" and "the presence of a plume is considered a significant, negative visual impact." The City asks how the power plant would be operated to effectively eliminate plumes.

The FSA identifies that the power plant as proposed would occasionally produce visible plumes from the cooling tower and HRSG stacks under certain weather conditions. Because of the visually sensitive nature of the project site and its surroundings and the absence of other industrial facilities in the vicinity that may produce visible plumes, the FSA proposes rigorous standards for managing visible plumes for this project. Exceeding any of these standards would constitute a significant visual impact. Condition of Certification VIS-10 would require that the power plant would be operated to meet the following plume abatement standards:

- No HRSG stack plume of any height shall be visible above the top of a HRSG stack at any time during daylight hours.
- No cooling tower plume shall extend more than 20 feet above the top or 50 feet beyond any edge of the cooling tower during daylight hours.
- No cooling tower plume that extends less than 20 feet in height above the top or less than 50 feet beyond the edge of the cooling tower shall persist for longer than 1 hour during daylight hours.
- No cooling tower plume shall be visible for more than 1 hour during daylight hours in any 24-hour period.
- Cooling tower plumes shall not be visible for more than a total of 14 hours during daylight hours in any calendar year.

The condition would require that the power plant immediately adjust its operations to meet all of the standards. If adjustments to operations do not rectify the condition to meet the standards, the power plant would be required to cease operations until the standard could be met. If more than 2 violations occur in any calendar year, the power plant would be required to immediately cease operating and the project owner would be required to subsequently prepare and submit a plan to the CEC that demonstrates how the plant will meet these standards. The plan would have to be approved by the CEC before operation of the power plant would be permitted to resume.

Night Lighting

The City of San Jose states that night lighting of the power plant “needs to be minimized and appropriately shielded” and “it is critical that the plant comply with the City Council Policy #4-3 entitled Outdoor Lighting on Private Development.”

The FSA includes Condition of Certification VIS-3, which meets or exceeds the standards for outdoor lighting identified in City Council Policy #4-3.

Architectural Design

The City of San Jose states that if the power plant is approved, its preference is that the architectural design “‘acknowledges the plant’ rather than disguises it as an office building.”

The power plant as proposed by the applicant includes architectural design features and forms that resemble both an office building and a power plant. Although the power plant employs screening and other features intended to help it blend with the campus industrial character intended for the area, some of these features and forms evoke an industrial character. The FSA proposes Conditions of Certification VIS-9 for changes to architectural design treatment and VIS-10 for plume abatement to help reduce the industrial appearance of the power plant and improve its compatibility with the campus industrial character that is intended for the area. Although the power plant’s industrial appearance would be reduced and its compatibility with its current surroundings and future development improved with

implementation of these conditions, the project would continue to have elements that identify the plant as an industrial facility and it is unlikely that it would be perceived to be an office building. Fully acknowledging the power plant as an industrial facility would require that it be redesigned. Such a redesign would likely result in additional visual impacts, some of which may be significant.

Significant Visual Impacts

The City of San Jose states that it agrees with CEC staff's assessment that "the project will result in significant unmitigated visual impacts" and that "this is true of all new development in North Coyote Valley as the visual landscape changes from an agricultural area to a built environment."

The FSA does identify significant visual impacts that are unmitigable. These significant visual impacts are based in part on the power plant creating a substantial reduction in visual character from rural to industrial.

PARKS AND RECREATION DEPARTMENT, COUNTY OF SANTA CLARA

Visual Impacts on Coyote Ranch, Coyote Creek County Park, and County-wide Trails

The County states that the HRSG stacks "will be visible from a number of vantage points along Coyote Creek and visually impact our park and trail users" in the vicinity of the project.

Based on field visits, it does not appear that the HRSG stacks or other parts of the power plant would be visible from vantage points along the creek and existing trail in foreground views. The trail is primarily on the east side of the creek and views of the power plant would be screened by tall, dense riparian vegetation along the creek. The upper portion of the HRSG stacks may be visible from a portion of the trail near Parkway Lakes. However, if upper portions of the stacks were visible, they would be in the middleground or distant foreground for a short section of trail and the view would contain other more dominant features such as power transmission towers and the road in the foreground. For these reasons, if the stacks were visible, they would not substantially reduce the visual character or quality of views from the trail.

The County states that "installation of landscape screening as a mitigation measure will require consultation with County Parks in order to ensure the appropriate plant selection and placement."

Condition of Certification VIS-7 for installation of aesthetic landscape screening along a portion of Coyote Road has been changed to include consultation on the planting plan with the Santa Clara County Parks and Recreation Department.

The County states that the FSA should address the proposed bicycle route along Santa Teresa Boulevard and connections between the proposed Fisher Creek Trail and the designated trail route along Bailey Avenue.

The FSA has been changed to include a discussion of the proposed bicycle trail along Santa Teresa Boulevard. Because trail connections between the proposed Fisher Creek Trail and Bailey Avenue are somewhat distant from the project site and views from the trail and urban reserve area are discussed in detail in the FSA, further discussion of this potential trail connection does not appear to be necessary.

Visual Impacts to Views from Fisher Creek Trail Corridor

The County states that the FSA should address “safe trail connections and access from the proposed Fisher Creek trail over Monterey Highway, Highway 101, and to/from Coyote Creek Parkway” and “the future overcrossing entry from the parkway into the Campus Industrial Area” to incorporate access for pedestrians, bicycles, and equestrians.

The discussion of views from the proposed overcrossing in the FSA includes a discussion of views from the proposed multi-use trail connection on the overcrossing.

PUBLIC COMMENTS

Public comments regarding visual resources are addressed in the summary of public comments in this document.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

The project as proposed has the potential to cause significant adverse visual impacts due to the effects of a substantial change to visual character and substantially reduced visual quality for views with moderate to high visual quality and moderately high to high visual sensitivity.

Effective implementation of the applicant's proposed mitigation measures, as modified and expanded by staff's recommendations, is expected to reduce visual impacts to less than significant levels for some views. However, project impacts would remain significant and unmitigable for views from the Blanchard Road area and would degrade the general visual character and quality of the area. In addition, the proposed power plant project would contribute substantially to producing significant cumulative visual impacts in the North Coyote Valley.

Also, the proposed project would not be in compliance with 16 applicable local laws, ordinances, regulations, and standards regarding visual resources. These include City of San Jose policies and guidelines pertaining to building height, development along designated trail corridors, permitted land uses in rural scenic corridors, riparian/parkway character, rural building massing, building silhouette, building

landscape, rooftop equipment screening and integration, adjacent property setbacks and screening, building facades blending with their surroundings, and visual screening of incompatible elements. In addition, the proposed project would not comply with a County of Santa Clara general plan policy for avoiding placement of gas metering stations along scenic roads and heavily traveled highways.

RECOMMENDATIONS

Staff finds that the Metcalf project has the potential to cause significant unmitigable visual impacts and does not comply with a variety of applicable local laws, ordinances, regulations, and standards regarding visual resources. If the Energy Commission decides to approve the project, the following conditions of certification should be adopted. These conditions are intended to reduce the proposed project's appearance as an industrial facility and help visually integrate it with its current and likely future surroundings.

PROPOSED CONDITIONS OF CERTIFICATION

VIS-1 Prior to the start of commercial operation, the project owner shall treat the project structures, buildings, and tanks visible to the public in a non-reflective color or colors with a low-reflectivity/low-gloss finish to minimize contrast and harmonize with the surrounding environment. The project owner shall maintain the color or colors and the finish for the life of the project.

Protocol: The project owner shall submit a treatment plan for the project to the California Energy Commission Compliance Project Manager (CPM) for review and approval. The treatment plan shall include:

- specifications, and 11" x 17" color simulations, of the treatment proposed for use on project structures, including structures treated during manufacture;
- a detailed schedule for completion of the treatment; and,
- a procedure to ensure proper treatment maintenance for the life of the project.

If the CPM notifies the project owner that revisions of the plan are needed before the CPM will approve the plan, the project owner shall submit to the CPM a revised plan.

After approval of the plan by the CPM, the project owner shall implement the plan according to the schedule and shall ensure that the treatment is properly maintained for the life of the project.

For any structures that are treated during manufacture, the project owner shall not specify the treatment of such structures to the vendors until the project owner receives notification of approval of the treatment plan by the CPM.

The project owner shall not perform the final treatment on any structures until the project owner receives notification of approval of the treatment plan from the CPM.

The project owner shall notify the CPM within one week after all precolored structures have been erected and all structures to be treated in the field have been treated and the structures are ready for inspection.

Verification: Not later than sixty (60) days prior to ordering the first structures that are color treated during manufacture, the project owner shall submit its proposed plan to the CPM for review and approval.

If the CPM notifies the project owner that any revisions of the plan are needed before the CPM will approve the plan, within thirty (30) days of receiving that notification, the project owner shall submit to the CPM a revised plan.

Not less than thirty (30) days prior to the start of commercial operation, the project owner shall notify the CPM that all structures treated during manufacture and all structures treated in the field are ready for inspection.

The project owner shall provide a status report regarding treatment maintenance in the Annual Compliance Report.

VIS-2 All fencing for the project shall be non-reflective.

Protocol: At least thirty (30) days prior to ordering the fencing the project owner shall submit to the CPM for review and approval the specifications for the fencing documenting that such fencing will be non-reflective.

If the CPM notifies the project owner that revisions of the specifications are needed before the CPM will approve the submittal, the project owner shall submit to the CPM revised specifications.

The project owner shall not order the fencing until the project owner receives approval of the fencing submittal from the CPM.

The project owner shall notify the CPM within one week after the fencing has been installed and is ready for inspection.

Verification: At least thirty (30) days prior to ordering the non-reflective fencing, the project owner shall submit the specifications to the CPM for review and approval.

If the CPM notifies the project owner that revisions of the submittal are needed before the CPM will approve the submittal, within thirty (30) days of receiving that notification, the project owner shall prepare and submit to the CPM a revised submittal.

The project owner shall notify the CPM within seven days after completing installation of the fencing that the fencing is ready for inspection.

VIS-3 Prior to the start of commercial operation, the project owner shall design and install all lighting such that light bulbs and reflectors are not visible from public viewing areas, including the riparian corridor, and illumination of the vicinity and the nighttime sky is minimized. Exterior floodlighting of structures must not occur. For all parking areas, low-sodium fixtures must be used, fixtures must be visually compatible with the surrounding landscape treatment, luminaire heights must be uniform and not exceed 20 feet, the lighting must be distributed uniformly throughout the parking areas and not exceed 0.5 foot-candles, light sources must not be visible from streets, and any pedestrian pathways must be illuminated to a maximum of 0.8 foot-candles. To meet these requirements:

Protocol: The project owner shall develop and submit a lighting plan for the project to the CPM for review and approval and to the City of San Jose for review and comment. The lighting plan shall require that:

- Lighting is designed so that exterior light fixtures are hooded, with lights directed downward or toward the area to be illuminated and so that backscatter to the nighttime sky is minimized. The design of this outdoor lighting shall be such that the luminescence or light source is fully shielded to prevent light trespass outside the project boundary.
 - High illumination areas not occupied on a continuous basis such as maintenance platforms or the main entrance are provided with switches or motion detectors to light the area only when occupied.
 - There shall be no exterior floodlighting of structures.
 - For all parking and other unroofed areas other than pedestrian walkways, only low-pressure sodium fixtures will be used and these fixtures will be visually compatible with the surrounding landscape treatment, luminaire heights will be uniform and not exceed 20 feet, the lighting will be distributed uniformly throughout the parking areas and not exceed 0.5 foot-candles, and light sources will not be visible from streets.
 - Any pedestrian pathways will be illuminated to a maximum of 0.8 foot-candles and may use lighting fixtures other than low-pressure sodium.
 - A lighting complaint resolution form (following the general format of that in attachment 1) will be used by plant operations, to record all lighting complaints received and document the resolution of those complaints. All records of lighting complaints shall be kept in the on-site compliance file.
- If the CPM notifies the project owner that revisions of the plan are needed before the CPM will approve the plan, the project owner shall prepare and submit to the CPM a revised plan.

Lighting shall not be installed before the plan is approved. The project owner shall notify the CPM when the lighting has been installed and is ready for inspection.

Verification: At least ninety (90) days before ordering the exterior lighting, the project owner shall provide the lighting plan to the CPM for review and approval and to the City of San Jose for review and comment.

If the CPM notifies the project owner that any revisions of the plan are needed before the CPM will approve the plan, within thirty (30) days of receiving that notification the project owner shall submit to the CPM a revised plan.

The project owner shall notify the CPM within seven (7) days of completing exterior lighting installation that the lighting is ready for inspection.

VIS-4 The project owner shall restore any and all areas that are disturbed during the construction or operation of any portions of the proposed underground utilities.

Protocol: The project owner shall submit a plan for restoring the surface conditions of any rights-of-way disturbed during construction of underground utilities to the CPM for review and approval and to the City of San Jose or Santa Clara County for review and comment for the portions of the linear facilities in their respective jurisdictions. The plan shall include grading to the original grade and contour and revegetation and restoration of surface conditions of the rights-of-way.

If the CPM notifies the project owner that revisions of the plan are needed before the CPM will approve the submittal, the project owner shall submit to the CPM a revised plan.

The project owner shall not implement the plan until the project owner receives approval of the submittal from the CPM.

The project owner shall notify the CPM within one week after the grading and revegetation has been installed and is ready for inspection.

Verification: At least sixty (60) days prior to beginning implementation of the surface restoration, the project owner shall submit the plan to the CPM for review and approval and to the City of San Jose or Santa Clara County for review and comment for the portions of the linear facilities in the respective jurisdictions.

If the CPM notifies the project owner that revisions of the submittal are needed before the CPM will approve the submittal, within 30 days of receiving that notification, the project owner shall prepare and submit to the CPM a revised submittal.

The project owner shall notify the CPM within seven (7) days after completing the surface restoration that it is ready for inspection.

VIS-5 Immediately before beginning use of the construction laydown area for the power plant, the project owner shall implement the installation of temporary aesthetic screening along the south and east sides and any of the eastern portion of the north side of the construction laydown area that may be visible to travelers on Monterey Road or passenger trains. The project owner shall also implement the installation of long-term aesthetic screening along the

west side of Monterey Road. The temporary aesthetic screening shall remain in place for the duration of the use of the laydown area. Temporary screening shall be high enough to obscure views of most of the lighting, as well as equipment, vehicles, and materials in the area, from the highway, railroad line, and nearby residences to the south. Immediately upon completion of construction of the project, the temporary aesthetic screening shall be removed and the construction laydown area shall be revegetated and restored to its original condition prior to construction or to an improved condition. The goal of the revegetation shall be to maintain the open space character of the site and area. The long-term aesthetic screening shall remain in place and be maintained by the project owner for the life of the power plant project.

Protocol: The project owner shall submit to the CPM for review and approval and to the City of San Jose for review and comment a specific plan describing its temporary and long-term aesthetic screening plans, providing evidence that the City of San Jose has been consulted regarding the plans, and attaching any recommendations from the City of San Jose. The plan shall include, but not be limited to:

- detailed plans, at a reasonable scale, which identify the type, character, colors, and other detailed information for the proposed temporary and long-term aesthetic screening;
- a detailed grading plan at a reasonable scale for the long-term aesthetic screening that shows natural-appearing undulating berms within the landscape buffer area along the west side of Monterey Road.
- elevations of the views of the temporary aesthetic screening showing how the objectives of the screening will be accomplished.
- any maintenance procedures; and
- a procedure and plan for removing the temporary aesthetic screening and revegetating the area, including a detailed revegetation plan, at a reasonable scale, which includes a list of proposed plant species and sizes; a discussion of the suitability of the plants for the site conditions and mitigation objectives; and procedures for irrigation, maintenance, and replacement planting.

If the CPM notifies the project owner that revisions of the plan are needed before the CPM will approve the plan, the project owner shall prepare and submit to the CPM a revised plan.

The temporary and long-term aesthetic screening and revegetation plans and any other plan features shall not be installed before the plans are approved. The project owner shall notify the CPM and the City of San Jose when the plans have been implemented and are ready for inspection.

Verification: At least ninety (90) days prior to the start of use of the construction laydown area for the power plant, the project owner shall submit the proposed temporary and long-term aesthetic screening plans to the CPM for review and approval and to the City of San Jose for review and comment. The project owner

shall submit any required revisions within thirty (30) days of notification by the CPM. The project owner shall notify the CPM in writing within seven (7) days after implementing the proposed plans that the temporary and long-term aesthetic screening installations are ready for inspection. The owner shall follow a similar schedule and procedures for submittal and inspection of the revegetation plan starting with submittal of the plan at least ninety (90) days before intended removal of the temporary aesthetic screening.

VIS-6 The project owner shall comply with the requirements of Policy 12 of the General Development Plan Standards of the Master Development Plan and Guidelines for the North Coyote Valley Campus Industrial Area (City of San Jose 1985) regarding screening of truck loading docks and storage and service areas and Guideline 2C of the Riparian Corridor Policy Study (City of San Jose 1994) regarding screening of parking areas, loading zones, trash enclosures, mechanical devices, and similar accessory uses.

Protocol: The project owner shall submit to the CPM for review and approval and to the City of San Jose for review and comment a plan for screening of truck loading docks, storage and service areas, parking areas, loading zones, trash enclosures, mechanical devices, and similar accessory uses that conforms to the requirements of Policy 12 of the General Development Plan Standards of the Master Development Plan and Guidelines for the North Coyote Valley Campus Industrial Area and Guideline 2C of the Riparian Corridor Policy Study. The screening shall be implemented prior to the beginning of operation of the power plant.

If the CPM notifies the project owner that revisions of the plan are needed before the CPM will approve the submittal, the project owner shall submit to the CPM a revised plan.

The project owner shall not implement the plan until the project owner receives approval of the submittal from the CPM.

The project owner shall notify the CPM within one week after the screening has been installed and is ready for inspection.

Verification: At least sixty (60) days prior to installing the screening, the project owner shall submit the plan to the CPM for review and approval and to the City of San Jose for review and comment. If the CPM notifies the project owner that revisions of the submittal are needed before the CPM will approve the submittal, within thirty (30) days of receiving that notification, the project owner shall prepare and submit to the CPM a revised submittal.

The project owner shall notify the CPM in writing within seven (7) days after completing installation of the screening that the screening is ready for inspection.

VIS-7 Immediately following the beginning of construction of the power plant, the project owner shall install aesthetic landscape screening along a portion of

Coyote Ranch Road between the power plant and Coyote Ranch in locations that would eventually help screen views from the ranch toward the power plant. Vegetation selected for landscape screening shall consist primarily of plants that are appropriate for and preferably native to the local region and trees that would grow quickly and reach a height of at least 40 feet.

Protocol: The project owner shall submit to the CPM for review and approval and to the City of San Jose and the County of Santa Clara Parks and Recreation Department for review and comment a specific plan describing its aesthetic landscape screening plan, including irrigation, along a portion of Coyote Ranch Road between the power plant and Coyote Ranch. The plan shall include, but not be limited to:

- a detailed landscape and irrigation plan, at a reasonable scale, which includes a list of proposed tree and, if needed, shrub species and sizes and a discussion of the suitability of the plants for the site conditions and mitigation objectives.
- Elevations of the views of the aesthetic landscape screening projected for 10 and 20 years from the time of startup of operation of the facility that show how the planting will appear.
- maintenance procedures, including any needed irrigation; and
- a procedure for replacing unsuccessful plantings.

If the CPM notifies the project owner that revisions to the plan are needed before the CPM will approve the plan, the project owner shall prepare and submit to the CPM a revised plan.

The landscaping screening and any other plan features shall not be installed before the plan is approved. The project owner shall notify the CPM, City of San Jose, and County of Santa Clara Parks and Recreation Department when the plan has been implemented and is ready for inspection.

Verification: At least ninety (90) days prior to the start of construction of the power plant, the project owner shall submit the proposed aesthetic landscape screening plan to the CPM for review and approval and to the City of San Jose and County of Santa Clara Parks and Recreation Department for review and comment. The project owner shall submit any required revisions within thirty (30) days of notification by the CPM. The project owner shall notify the CPM in writing within seven (7) days after completing the implementation of the proposed plan that the aesthetic landscape screening installation is ready for inspection.

VIS-8 The gas metering station east of Highway 101 shall be designed in a manner that helps visually screen it from views from Highway 101 and integrate it with its surroundings. To accomplish these objectives, the facility shall measure no larger than 35 feet by 80 feet; the facility shall have no permanent outdoor lighting; the prefabricated shed shall not exceed 10 feet

in height; the fence enclosing the facility shall be 8 feet in height and shall have a medium to dark color and a non-reflective finish; no other elements in the facility enclosure shall exceed 5 feet in height; the pipes, valves, and other elements in the facility shall be brown in color and have low-reflectivity/low gloss finishes; and landscape screening shall be provided around the exterior of the facility. Landscape screening shall consist of a mix of large (greater than 8 feet height and spread at maturity), drought-tolerant shrubs of the same or visually similar species as other large native shrubs near the site (e.g., baccharis sp. and rhamnus sp.) arranged in informal, naturalistic patterns to blend with the existing character of the surrounding landscape. At the time of planting, large shrubs shall be at least 4 feet in height and spread. Other drought-tolerant species of smaller shrubs and grasses may be used to provide visual interest and variety providing the objectives for screening and visual integration are met.

Protocol: At least sixty (60) days before the beginning of construction of the gas metering station east of Highway 101, the project owner shall submit its aesthetic treatment and landscape screening plan, including irrigation, to the CPM for review and approval and to the County of Santa Clara Parks and Recreation Department for review and comment. The plan shall include, but not be limited to:

- detailed color elevations, at reasonable scales, indicating the precise colors and appearance of the shed, fence, pipes, valves, and all other elements of the gas metering station;
- color and finish samples for all colors and materials to be used at the facility and a fence material sample showing the color and finish to be used for the fence;
- a detailed landscape and irrigation plan, at a reasonable scale, which includes a list of proposed plant species and sizes and a discussion of the suitability of the plants for the site conditions and mitigation objectives.
- south, west, and north elevations of the aesthetic landscape screening projected for 2 and 5 years from the time of startup of operation of the facility that show how the planting will appear.
- maintenance procedures, including any needed irrigation; and
- a procedure for replacing unsuccessful plantings.

If the CPM notifies the project owner that revisions to the plan are needed before the CPM will approve the plan, the project owner shall prepare and submit to the CPM a revised plan.

The aesthetic treatment, landscaping screening, and any other plan features shall not be installed before the plan is approved. The project owner shall notify the CPM when the plan has been implemented and is ready for inspection.

Verification: At least sixty (60) days before the beginning of construction of the gas metering station east of Highway 101, the project owner shall submit the

proposed aesthetic treatment and landscape screening plan to the CPM for review and approval and to the County of Santa Clara Parks and Recreation Department for review and comment. The project owner shall submit any required revisions within 30 days of notification by the CPM. The project owner shall notify the CPM, within seven (7) days after implementing the proposed plan that the aesthetic treatment and landscape screening installation is ready for inspection.

VIS-9 The power plant shall be designed in a manner that reduces its appearance as an industrial facility and helps visually integrate it with its surroundings. To accomplish these objectives, some elements of the power plant's appearance that draw attention to it as an industrial facility shall be required to be changed. These elements include the exposed topworks on the screened HRSG units; the catwalks wrapping around the HRSG stacks; and the architectural design treatment of the screening for the HRSG units, cooling tower, and tanks. Changing these elements is intended to help better fit the structures and the power plant with the rural visual character of their existing surroundings and the architectural character of probable future buildings in the Campus Industrial Area development described in the North Coyote Valley Campus Industrial Area Master Development Plan (City of San Jose 1985 and 1999).

Protocol: Prior to the start of construction, the project owner shall submit an architectural design treatment plan to the CPM for review and approval and to the City of San Jose for review and comment. This plan shall show how the following will be accomplished:

- Screen at least eighty percent (80%) of the vertical portion of the exposed topworks using the minimum width and length of screening necessary to enclose and visually screen them when viewed from around the area. Screening shall not be accomplished by extending the proposed exterior lines of screening on the HRSG units higher, but shall be accomplished by using screening of a similar architectural design character as for the HRSG units, providing the minimum needed to adequately cover the elevational exterior and width and length of the topworks, and integrating the architectural designs of each to create a unified design appearance.
- Eliminate the industrial appearance of the catwalks by inseting them on the HRSG stack screening to create smooth vertical lines on the stacks or in some other way minimize the visual contrast and industrial appearance of the catwalks.
- Change the architectural design treatment of the screening for the HRSG units, cooling tower, and tanks to better fit the structures and the power plant with the existing visual character of the area and the architectural character of probable future buildings in the Campus Industrial Area development; treatment changes shall include using colors, lines, forms, textures, patterns, fenestration, materials, and finishes similar to those of buildings to be constructed nearby in the Campus Industrial Area.

The plan shall include, but not be limited to:

- Specification of the architectural design treatment proposed for all project structures visible from off the project site, including, but not be limited to, the HRSG units and stacks, cooling tower, and tanks.
- Elevations of all views of the power plant showing the new architectural design treatment, including changes to the catwalks and screening of the topworks, proposed for all project structures visible from off the project site; the elevations shall clearly show the colors, forms, materials, finishes, and other detailed information for the architectural design treatment of structures.
- A procedure to ensure proper maintenance of the architectural design treatment for the life of the project.

If the CPM notifies the project owner that revisions to the plan are needed before the CPM will approve the plan, within 30 days of receiving that notification, the project owner shall submit to the CPM a revised plan.

After final approval of the plan by the CPM, the project owner shall implement the plan. The project owner shall notify the CPM when the plan has been implemented and all structures are ready for inspection. The project owner shall ensure that the treatment is properly maintained for the life of the project.

Verification: At least sixty (60) days prior to the start of construction of the power plant, the project owner shall submit the proposed architectural design treatment plan to the CPM for review and approval and to the City of San Jose for review and comment. The project owner shall submit any required revisions within thirty (30) days of notification by the CPM. The project owner shall not begin implementation of any parts of the final architectural design treatment on any structures until the project owner receives notification of approval of the plan from the CPM. Not less than thirty (30) days prior to the start of commercial operation, the project owner shall notify the CPM in writing that all structures are ready for inspection.

VIS-10 The power plant shall be operated in a manner that reduces its appearance as an industrial facility and helps visually integrate it with its surroundings. To accomplish these objectives, the power plant shall be operated to minimize visible plumes. The power plant shall be operated to meet the following plume abatement standards:

- No plume from the HRSG stack of any height shall be visible above the top of a HRSG stack at any time.
- No visible plume from the cooling tower shall extend more than 20 feet above the top or 50 feet beyond any edge of the cooling tower at any time.

- No plume from the cooling tower shall be visible for more than 1 hour during any 24-hour period.
- Cooling tower plumes shall not be visible for more than a total of 14 hours in any calendar year.

The power plant shall be operated in a manner that meets these standards and shall immediately adjust its operations to meet the standards whenever weather or other conditions necessitate adjustments to operation to meet the standards. If adjustments to operations do not rectify the condition to meet any and all of the standards, the power plant shall cease operations until the standard(s) can be met. If more than 2 violations of any standard or standards occur in any calendar year, the power plant shall immediately cease operating and subsequently prepare and submit a revised operating plan to the CPM that demonstrates how the plant will meet these standards. The revised operating plan must be approved by the CPM before operation of the power plant is permitted to resume.

Protocol: Prior to the start of construction, the project owner shall submit to the CPM for review and approval and to the City of San Jose for review and comment a plume abatement plan that describes how the power plant will be operated to meet the standards for minimizing visible plumes during daylight hours. The plume abatement plan shall also identify any adjustments to operations that will be necessary to meet the standards whenever weather or other conditions necessitate adjustments to operations to meet the standards.

The plan shall include, but not be limited to:

- Operating procedures of the power plant to meet the standards for abatement of visible plumes during daylight hours.
- Operating procedures for immediately adjusting power plant operations to meet the standards whenever weather or other conditions necessitate adjustments to meet the standards.
- Procedures for monitoring and reporting the size, duration, and frequency of occurrence of any visible plumes.

If the CPM notifies the project owner that revisions to the plume abatement plan are needed before the CPM will approve the plan, within thirty (30) days of receiving that notification, the project owner shall submit to the CPM a revised plan.

The project owner shall not start construction of the power plant until the CPM has approved the plume abatement plan. The project owner shall implement the plume abatement plan and shall ensure that the monitoring and reporting is properly conducted for the life of the project.

Verification: At least sixty (60) days prior to the start of construction of the power plant, the project owner shall submit the proposed plume abatement plan to

the CPM for review and approval and to the City of San Jose for review and comment. The project owner shall submit any required revisions within 30 days of notification by the CPM. The project owner shall not begin construction of the power plant until the project owner receives written notification of approval of the plume abatement plan from the CPM.

VIS-11 The project owner shall not install landscape screening in the form of a dense evergreen hedge along any portion of the Fisher Creek corridor or future trail between Blanchard Road and the railroad tracks. The project owner shall plant the trail corridor using appropriate native vegetation that would enhance the visual character and quality of views and habitat along the trail corridor. Vegetation selected for planting along the trail corridor shall consist of plants that are appropriate for and native to the local region and that provide aesthetic and habitat benefits for the trail corridor.

Protocol: The project owner shall submit to the CPM for review and approval and to the City of San Jose and the County of Santa Clara Parks and Recreation Department for review and comment a specific plan describing its landscape plan, including irrigation, along all portions of the Fisher Creek corridor between Blanchard Road and the railroad tracks that are designated to include a trail. The plan shall include, but not be limited to:

- a detailed landscape and irrigation plan, at a reasonable scale, which includes a list of proposed plant species and sizes and a discussion of the suitability of the plants for the site conditions and objectives.
- maintenance procedures; and
- a procedure for replacing unsuccessful plantings.

If the CPM notifies the project owner that revisions to the plan are needed before the CPM will approve the plan, the project owner shall prepare and submit to the CPM a revised plan.

The plantings and any other plan features shall not be installed before the plan is approved. The project owner shall notify the CPM, City of San Jose, and County of Santa Clara Parks and Recreation Department when the plan has been implemented and is ready for inspection.

Verification: At least ninety (90) days prior to the start of construction of any portion of the trail between Blanchard Road and the railroad tracks, the project owner shall submit the proposed aesthetic landscape screening plan as required above. The project owner shall submit any required revisions within thirty (30) days of notification by the CPM. The project owner shall notify the CPM within seven (7) days after implementing the proposed plan that the planting installation is ready for inspection.

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FIGURES

APPENDIX 1. SETTING – VIEWS OF THE PROJECT SITE

The project site is visible from a variety of locations in the area. The visual character and quality and visual sensitivity associated with views of the project site from key viewing locations are described below.

This detailed description of views of the project site distinguishes the existing baseline conditions from likely future conditions that include planned development of the Campus Industrial Area in the North Coyote Valley. Describing conditions that are likely to occur in the foreseeable future is intended to provide a context for understanding the transition in visual character that is likely to occur in the North Coyote Valley in the near future and is not used as part of baseline conditions for assessing the significance of impacts under CEQA.

Likely future conditions in the North Coyote Valley are for high quality planned campus industrial and residential development that would increase visual sensitivity for views in and around the valley and change the visual character of the valley from rural and natural to more developed. Development is intended to be of a type and quality that is “sensitive to the area’s environmental features, such as hills, views, existing trees, and agricultural history” and “preserves much of the natural features of the area” (City of San Jose 2000b, p. 5 and 7). Visual sensitivity in the area would increase because of a large increase in numbers of viewers, both area residents and workers, who would have a fairly high awareness of and concern for the visual quality of their surroundings based on the intended “visual harmony and continuity throughout the Campus Industrial Area” (City of San Jose 2000b, p. 17).

The viewers, visual sensitivity, and visual quality associated with existing conditions for views of the project site from key locations are described below and summarized in Table Vis-1 in the Visual Resources section. In addition, the viewers, visual sensitivity, and visual quality associated with likely future conditions are described for each of the key locations; these are summarized in Table Vis-2 in the Visual Resources section.

VIEWS FROM BLANCHARD ROAD AREA

EXISTING CONDITIONS

Blanchard Road is located approximately 900 feet southeast of the project facility site. Four residences are located along the road directly southeast of the facility site. One of these homes has unobstructed views of the project site about 800 feet away. The project site is visible to varying degrees from areas around the other homes and from the road. Two additional residences are located along the road farther to the west; however views of the project site from in the immediate vicinity of these homes appear to be largely blocked by Tulare Hill and vegetation along Fisher Creek

VISUAL SENSITIVITY

Viewer sensitivity is high for views from in and around the residences. Because the project site is within the foreground distance zone for views from in and around the

residences and viewer sensitivity is high, the visual sensitivity for these views is high.

VISUAL QUALITY

Views from the Blanchard Road area are of open agricultural fields, a distinctive line of mature trees, and the shoulder of the grass-covered Tulare Hill. Visual Resources Figure 4 shows the view from KOP 1. Several tall power transmission towers are visible along the brow of the hill and several protrude above the trees near the base of the hill. The towers along the brow of the hill are widely separated, somewhat light and translucent in form, and although profiled against the sky, tend not to dominate their surroundings. The towers near the base of the hill are closer, stand out more against the sky, and are more noticeable; however, they are partially screened by the trees and tend not to dominate the view. These elements somewhat diminish the intactness, unity, and vividness of the view because their form and line contrast with the otherwise natural forms in the view. Because power transmission lines are somewhat common elements in the regional landscape and these towers are subordinate within the overall view, they do not substantially affect the quality of the overall view. Views from in and around residences along Blanchard Road, including views from along the road itself, are generally moderately high in intactness, unity, and vividness. Therefore, based on this and the dominance of natural forms and the strong display of rural character, the visual quality of this view is considered moderately high.

FUTURE CONDITIONS

VISUAL SENSITIVITY

Likely future views of the project site would be by residents from Blanchard Road as described above and by workers in the North Coyote Valley Campus Industrial Area (NCVCIA). Because workers in the NCVCIA would be expected to have a moderately high awareness of and concern for visual quality in and around the area and the project site would be visible within the foreground distance zone for some views, visual sensitivity for future views of the project site by workers at the NCVCIA would be moderately high. Visual sensitivity for views from in and around residences would continue to be high.

VISUAL QUALITY

Visual quality for future views north of the project site would be likely to continue to be moderately high for the reasons described above.

VIEWS FROM NORTHBOUND MONTEREY ROAD, RAILROAD, COYOTE, AND RESIDENCES

EXISTING CONDITIONS

The project site is visible from Monterey Road, the railroad, the community of Coyote, and several residences along Monterey Road south of the site. Monterey Road is a well-traveled thoroughfare running northwest and southeast through the Coyote Valley. The project site is located within 150 feet of the road and is highly

visible in foreground views for people traveling either northbound or southbound along the road. Northbound travelers would have fairly long duration views of the site and the site would be visible within their primary viewcone. A traffic light at the road's intersection with Blanchard Road increases the viewing time for some traffic that would be stopped at the light. Visual Resources Figure 5 shows the view from KOP 2.

Customers, employees, and users of the commercial and business establishments and Grange Hall in the small rural community of Coyote would also have foreground views of the site. Also, the site is visible from several residences located along the east side of Monterey Road and to travelers from trains using the railroad line along the site's east side. The two more northerly residences would have views of the site within the foreground distance zone and a third residence, located just over ½-mile from the site, would have views of the site in the middleground. Railroad passengers would have foreground views of and look directly onto the project site from their elevated positions on the trains.

VISUAL SENSITIVITY

Viewer sensitivity is considered to be moderate to moderately high for people traveling for work, recreation, and leisure on Monterey Road. The project site is in the foreground distance zone of views by high numbers of people traveling northbound on Monterey Road and the site is within the travelers' primary view cone and of fairly long duration. For these reasons, visual sensitivity for views by northbound travelers on Monterey Road would be moderately high.

Similarly, travelers on trains include people with concern for visual quality. These trains are used primarily by people commuting to and from work with moderate to moderately high awareness of and concern for visual quality. Although viewer sensitivity is moderate to moderately high and the project site is within the immediate foreground distance zone for views from trains, views of the project site are of a somewhat short duration. Because these views are of fairly short duration, viewers' awareness of and concern for views of the project site are moderate and visual sensitivity for these views is also moderate.

The project site is also partially visible in foreground views by residents with high viewer sensitivity from in and around their residences along the east side of Monterey Road. Visual sensitivity for foreground views of the site by residents from in and around their homes is high.

Customers, employees, and other users of business establishments in the small rural community of Coyote and local area residents traveling around the area have moderately low to moderate viewer sensitivity. Visual sensitivity for views of the site by these viewer groups would be moderately low to moderate.

VISUAL QUALITY

Views toward the project site for northbound travelers along Monterey Road are primarily of the roadway, the railroad corridor, the row of tall trees on the project site, and Tulare Hill. Power transmission towers are also visible along the brow of

Tulare Hill. South of the small community of Coyote, a row of large walnut trees along the southwest side of the road generally screens views of the project site for northbound travelers. North of Coyote, views toward the project site are not screened. These views from the road, Coyote, and residences are of the roadway, railroad, scattered trees, power poles, light standards, signs, open agricultural fields, the tall grove of trees on the project site, grass-covered Tulare Hill, and power transmission towers along the brow and near the eastern base of the hill (see Visual Resources Figure 5).

For northwesterly views toward the project site, the elements within the road and railroad corridor in the viewers' immediate foreground somewhat reduce the overall intactness, unity, and vividness of views. The power transmission towers also reduce the intactness, unity, and vividness of views of the more natural forms, lines, textures, and colors of the open agricultural land, grass-covered hillside, and tall trees near the base of the hill. However, these softer, more natural forms dominate the overall views toward the project site. Given the dominance of natural forms and elements that reinforce or are commonly seen in the regional rural environment in combination with the other elements in the roadway corridor in the immediate foreground, overall visual quality for northwesterly views from Monterey Road, Coyote, and residences on the east side of the road is moderate.

Because views of the project site from northbound trains do not include the elements of the roadway corridor, the intactness, vividness, and unity of these views is moderately high and visual quality for views from trains is moderately high.

FUTURE CONDITIONS

VISUAL SENSITIVITY

With development of the North Coyote Valley Campus Industrial Area and urban reserve, numbers of viewers traveling along Monterey Road would increase substantially in the near future. These viewers would likely consist largely of workers at the NCVCA and area residents who would be expected to have a moderately high awareness of and concern for visual quality in and around the area and therefore moderately high viewer sensitivity. Because of the larger number of viewers with moderately high viewer sensitivity and because the project site would be visible within the foreground distance zone for some views, visual sensitivity for future views of the project site from Monterey Road would be moderately high.

Future views from trains would continue to be of moderate visual sensitivity. Visual sensitivity of future views by customers, employees, and users of business establishments in Coyote and local residents traveling around the area would continue to be moderately low to moderate. Visual sensitivity for future views from in and around residences would continue to be high.

VISUAL QUALITY

Visual quality for future views from Monterey Road, Coyote, and residences on the east side of the road would be likely to continue to be moderate. Visual quality of

views from northbound trains would continue to be moderately high for the reasons described above.

VIEWS FROM FUTURE OVERCROSSING FOR CAMPUS INDUSTRIAL AREA

EXISTING CONDITIONS

The master plan for the North Coyote Valley Campus Industrial Area identifies the need for a major access road to be developed as a parkway connecting Highway 101 to the future development. This primary northern access road is identified as a major gateway to the development that would cross over Coyote Creek, Monterey Road, and the railroad. The parkway, combined with a restored Fisher Creek, is intended to become a major design feature of and the major organizing circulation route for the development. The City of San Jose (1985) has stated that the elevated overcrossing of Monterey Road and the railroad “will introduce the Valley development to visitors” and the “views of the natural Santa Teresa Hills [would] draw the traveler into the Valley”. Visual Resources Figure 6 shows an artist’s concept of the view straight ahead along the intended parkway from the overcrossing at Monterey Road. Visual Resources Figure 2 is an existing view straight along the intended parkway southwest from the future overcrossing. Visual Resources Figure 7 shows the view from KOP 3 looking northwest from the intended overcrossing toward the project site. The overcrossing would be located approximately ½-mile from the project site and it would afford broad views of the valley, hills, and proposed Campus Industrial Area, including the project site.

VISUAL SENSITIVITY

Presently, the overcrossing does not exist. Because of this, there are no viewers from this location and a description of visual sensitivity is not applicable for this baseline condition.

VISUAL QUALITY

Because the overcrossing does not yet exist, visual quality for views from this KOP is described in detail below for the likely future condition. Based on the description below, the visual quality of views from this location for this baseline condition is considered moderately high.

FUTURE CONDITIONS

VISUAL SENSITIVITY

The gateway overcrossing is a central feature of the planned Campus Industrial development that is intended to be constructed in the foreseeable future. For future views from the overcrossing, the project site would be at the outer edge of the foreground distance zone for high numbers of viewers entering the primary gateway to the Campus Industrial Area. Viewers progressing along the parkway from the freeway interchange would view the project site from the elevated parkway for a moderate period of time. These viewers, who would consist primarily of NCVCA workers and visitors, would have a moderately high concern for visual quality. The overcrossing is also intended to include a multi-purpose trail that would provide a

connection between the Coyote Creek Parkway and the Campus Industrial Area for pedestrians, bicyclists, and equestrians; these recreationists would have high viewer sensitivity. For these reasons, visual sensitivity would be moderately high to high for future views of the project site from the gateway overcrossing.

VISUAL QUALITY

The elevated position of the gateway overcrossing would afford viewers broad vistas of the rural valley, scenic Santa Teresa Hills, and future Campus Industrial development. Views would be primarily focused straight ahead along the proposed parkway and toward the scenic hills. However, views to the northwest toward the project site would be an important part of the sweeping vista from the gateway overcrossing. Views toward the project site are of extensive agricultural fields, a cluster of rural homes and farm buildings, riparian and other trees near the base of the hill, and the grass-covered Tulare Hill. The long reflective roof of the farm building and the distant power transmission towers tend to reduce the intactness and vividness of the view somewhat; however, the view is generally of moderately high vividness and intactness and moderate unity. Tall palm and other trees around the low buildings help blend them with their surroundings and reinforce a strong rural image typical, yet increasingly scarce, in the valley and the region. The power transmission towers along the brow of Tulare Hill are noticeable but not strong elements of the overall scene. Although the railroad tracks in the immediate foreground are strong linear elements, they reinforce and add to the rural character of the scene. Depending on how the railings, gateway sculptural elements, and landscaping for the future overcrossing are designed, the tracks may not be strong elements of the immediate foreground, but would be likely to remain visible farther to the northwest.

Likely development of the Campus Industrial Area would add elements to the valley that would change views and rural character to a high quality campus-like business commercial landscape with buildings and extensive landscaping. The high-quality development is intended to be a cohesive and highly unified design with extensive landscaping and would be likely to maintain moderately high vividness and intactness and increase the unity of views from this location.

Overall, the view toward the project site is picturesque and rural and is likely to change in character to a high quality campus-like business commercial landscape. For the reasons described above, the visual quality of the view toward the project site is moderately high for both existing and future conditions.

VIEWS FROM SANTA TERESA BOULEVARD

EXISTING CONDITIONS

Santa Teresa Boulevard is a four-lane arterial road that runs northwest and southeast through the western side of Coyote Valley. The road's median strip and edges are well-landscaped, anticipating the development of the Campus Industrial Area. Presently, the boulevard carries moderate traffic, but it will be an important and heavily-used thoroughfare once the area is developed for Campus Industrial uses. It is expected to receive particularly heavy use once the urban reserve area

to the south is developed. The City of San Jose plans to extend its light rail line along the boulevard when development of the area increases the need for public transit in this area. Also, a bicycle route is intended to be built along Santa Teresa Boulevard that would be designated as part of the 1,200-mile Juan Bautista de Anza National Historic Trail and serve as an important cross-valley connector and commuter route (Santa Clara County 2000).

Views toward the project site are primarily by northbound traffic. Visual Resources Figure 8 shows the view from KOP 4. The project site is only visible from the road in the middleground from about a mile south and farther because the southern toe of Tulare Hill blocks views of the site from portions of the road farther to the north. Views in the direction of the project site are of the landscaped edge of the boulevard, agricultural fields stretching across the valley, scattered trees, rural-looking homes and buildings near the base of the Silver Creek Hills, and the rolling grass-covered hills themselves. Power transmission lines are visible running up the hillside. The tops of metal towers at the Metcalf Substation are also visible, but are partially screened by trees and are not a strong element in the view.

VISUAL SENSITIVITY

The project site is presently in the middleground distance zone of views by moderate numbers of people with moderate viewer sensitivity traveling northbound on Santa Teresa Boulevard. These views of the site are within the travelers' primary view cone and of fairly long duration. Because the project site is in the middleground distance zone for views from the boulevard and the current number of viewers is moderate, visual sensitivity is currently moderate.

VISUAL QUALITY

Views toward the project site for northbound travelers on Santa Teresa Boulevard are predominantly of open agricultural fields and grass-covered hillsides (see Visual Resources Figure 8). These views are characteristic of the rural environment of the area. The mix of buildings and trees in the middleground across the field supports this rural character. Although the power lines running up the hillside and the towers at the substation are noticeable, they do not detract appreciably from the intactness of the view. The landscaped edge of the roadway in the foreground is attractive and provides a strong sense of design unity. However, the recently upgraded four-lane arterial boulevard appears orderly and modern and contrasts somewhat with the rural character of the views beyond the roadway corridor. Overall, for views toward the project site from the boulevard, intactness, unity, and vividness are moderately high and visual quality is moderately high.

FUTURE CONDITIONS

VISUAL SENSITIVITY

Future views of the site would be by substantially higher numbers of viewers with a moderately high concern for visual quality of the area for reasons similar to those described for Monterey Road. In addition, bicyclists on the intended bicycle route along the boulevard would also have a moderately high to high viewer sensitivity.

Because the expected number of future viewers with moderately high to high concern for visual quality would be high and the project site would be visible in middleground views, future visual sensitivity would be moderately high for views from Santa Teresa Boulevard.

VISUAL QUALITY

Visual quality of future views would be similar to that described for existing views except that likely development of the Campus Industrial Area would add elements to the valley that would change views and rural character to a high quality campus-like business commercial landscape with buildings and extensive landscaping. The high-quality development is intended to be a cohesive and highly unified design with extensive landscaping and would be likely to maintain moderately high vividness and intactness and increase the unity of views from this location. Also, elements of the Campus Industrial development would be likely to screen or dominate views of the project site from Santa Teresa Boulevard.

Overall, the view toward the project site is picturesque and rural and is likely to change in character to a high quality campus-like business commercial landscape. For the reasons described above, the visual quality of views toward the project site from Santa Teresa Boulevard for future conditions would be moderately high.

VIEWS FROM HIGHWAY 101

EXISTING CONDITIONS

Highway 101 is a highly-traveled freeway running northwest and southeast along the lower slopes of the Silver Creek Hills on the northeast side of the Coyote Valley. The highway through the valley is designated as a Landscaped Throughway and Rural Scenic Corridor by the City of San Jose (1994) and is considered the major southern gateway to the city. For the large numbers of northbound travelers on this major route, views of the valley and surrounding hills provide important first impressions of the area. Also, Santa Clara County (1994b) has designated Highway 101 as a scenic highway in recognition of the aesthetic importance of this area.

The project site for the power plant is visible intermittently from the highway for both northbound and southbound travelers. For southbound travelers, the site is visible from the highway in the middleground to the south and southwest in the vicinity of Parkway Lakes and the Metcalf Substation. For northbound travelers, the project site is visible intermittently in the middleground from various points along the highway and in the foreground from the highway in the vicinity of Coyote Ranch. Visual Resources Figure 9 shows the view from KOP 5. The project site is generally in the viewcone of both northbound and southbound travelers; however, the site is nearer to the highway for southbound viewers. Views toward the site from the highway are of scattered trees and shrubs within and near the landscaped highway corridor, trees within the riparian corridor along Coyote Creek between the site and highway, and grass-covered Tulare Hill. Power transmission towers on Tulare Hill and at the Metcalf Substation are visible in most views toward the site.

The towers at the substation are highly visible in most views from the north for southbound travelers.

In addition to the power plant site, the project would include a gas metering station within the scenic corridor of Highway 101. The gas metering station would be located approximately 280 feet east of the highway right-of-way and 370 feet east of the highway itself on land under the jurisdiction of Santa Clara County. It would be slightly lower in elevation than the highway and clearly visible in foreground views for both northbound and southbound travelers. It would also be visible to people from the County Sports Field Park, a public recreational shooting facility, and to people driving to and from this facility along Malech Road and the access road immediately adjacent to the proposed site of the gas metering station.

VISUAL SENSITIVITY

The site for the proposed power plant is in the middleground and foreground distance zones of views by high numbers of people traveling along this route for recreation, leisure, and other purposes. This major north-south thoroughfare carries high numbers of people with a high concern for visual quality and is a locally-designated scenic highway and Rural Scenic Corridor through the Coyote Valley. Views of the site are within travelers' view cones and are intermittent. For both northbound and southbound travelers, the site is visible in the foreground distance zone for a fairly brief length of time. Because the site is visible in the foreground to high numbers of viewers with a high concern for visual quality, the highway in this area is designated as scenic, and views of the project site are partially screened and of fairly short duration, visual sensitivity is moderately high.

Although the gas metering station site is visible for a moderate duration, it is located within a designated scenic highway corridor where it would be highly visible in foreground views to large numbers of viewers with high viewer sensitivity. For these reasons, the visual sensitivity of views of the gas metering station site would be high.

VISUAL QUALITY

Views toward the proposed power plant site for southbound travelers along Highway 101 are primarily of the rural and picturesque valley, surrounding hills, Tulare Hill, riparian trees along Coyote Creek, the landscaped highway corridor, and the substation. For views from the north, the project site is mostly in the middleground and the dense clusters of transmission towers at the substation near the freeway tend to dominate the view and substantially reduce the intactness, unity, and vividness. Visual quality for southbound views from the highway is moderately low to moderate.

For views from the south and east, the dominant visual elements are the landscaped highway corridor, trees in the riparian corridor, the cluster of palm trees protruding above Coyote Ranch, and the grass-covered Tulare Hill (see Visual Resources Figure 9). Towers at the substation are farther to the north and do not dominate the view toward the site. The towers at the base of and along the brow of Tulare Hill reduce the intactness of the view somewhat. For northbound travelers,

overall views of the rural valley are highly scenic and vividness, intactness, and unity of these views are generally high. For foreground views of the project site from the highway, vividness is moderate and intactness and unity are moderately high. Visual quality for northbound views from the highway is moderately high.

For the gas metering station site east of Highway 101, views from the highway and other roads nearby include grasslands and scattered shrubs on and around the site, several power transmission towers, several signs, low fences, roads, and the Silver Creek Hills in the background. Views of the hills, grasslands, and scattered shrubs are of moderately high intactness, unity, and vividness within the context of the area. Although the transmission tower near the site somewhat reduces the intactness and natural character of views of the site and its surroundings, the transmission towers, fences, and roads are typical of elements found in rural areas in the region and reinforce the rural character of the area. For these reasons, the visual quality of views of the gas metering station site from Highway 101 and other roads nearby is moderately high.

FUTURE CONDITIONS

VISUAL SENSITIVITY

Future visual sensitivity for views of the power plant site and gas metering station site from Highway 101 would be similar to those described above for existing views. Development of the Campus Industrial Area would change the visual character of views toward the power plant project site substantially.

VISUAL QUALITY

Future visual quality for views of the power plant site and gas metering station site from Highway 101 would be similar to those described above for existing views. Development of the Campus Industrial Area would not substantially reduce the visual quality of views because of the high quality standards required for development within the NCVCA.

VIEWS FROM PARKWAY LAKES

EXISTING CONDITIONS

Parkway Lakes is a recreation area located between one-half and one mile north of the project site between Monterey Road and Highway 101. The facility is on Santa Clara County Parks and Recreation land and is part of the Coyote Creek Parkchain. The creek corridor and county bike trail run adjacent to the facility along its western edge. The site may be partially visible from some portions of the trail (Santa Clara County 2000), however views of the site from the trail are generally screened by dense riparian vegetation or topography and the site is in the middleground or background distance zone. The Parkway Lakes facility's main purpose is for fishing. Large numbers of recreationists use the facility with the highest use occurring on summer weekends. Visual Resources Figure10 shows the view from KOP 6.

VISUAL SENSITIVITY

The project site is primarily in the middleground of views to the south from the Parkway Lakes recreation area and the county trail. Visitation at the facility and use of the trail is heavy and viewers tend to have opportunities for long-duration views. Visitors to the Parkway Lakes facility and trail users are recreationists that generally have a high awareness of and concern for visual quality and therefore have high viewer sensitivity. Because the site is visible in the middleground to high numbers of viewers with high viewer sensitivity, visual sensitivity is moderately high.

VISUAL QUALITY

Views toward the project site from the recreation area are primarily of open water, mostly barren banks with some low vegetation, grass-covered Tulare Hill, riparian trees along the creek corridor, and power transmission towers extending along the brow of Tulare Hill and at the Metcalf Substation. The Coyote Valley and surrounding hills, other than Tulare Hill, are not readily visible from the facility or trail. The clustered towers at the substation are noticeable in views toward the site but are generally to the east and partially screened near their bases. Although they do not dominate the view toward the site, the presence of towers at both the Metcalf Substation and along the generally level horizon somewhat reduce the intactness, unity, and vividness of the views south. Although views of the open water and nearby riparian trees add to the visual variety and interest, foreground views of the mostly barren shorelines and banks somewhat reduce the intactness, unity, and vividness of these views. For views of the project site from the Parkway Lakes recreation area and trail, vividness, intactness, and unity, and therefore visual quality, are moderate.

FUTURE CONDITIONS

VISUAL SENSITIVITY AND QUALITY

Future visual sensitivity and quality for views of the project site from Parkway Lakes and the county trail would be similar to those described above for existing views.

VIEWS FROM COYOTE RANCH AND COYOTE CREEK TRAILS

EXISTING CONDITIONS

Coyote Ranch is a privately-operated recreation facility on public land that is part of the Coyote Creek Parkchain and owned by the Santa Clara County Parks and Recreation Department. The facility includes an historic 1880 ranch house that is used as a residence and its surrounding grounds, including a large picnic grove, open play fields for sports and games, and a gravel parking area. Typical events staged at the facility include catered picnics, conventions, hayrides, parties, barn dances, and other special events. The facility receives heavy recreational use especially from May through October. The project site is within ½-mile to the west of and readily visible in the foreground of views from Coyote Ranch. Although views of the project site from the residence itself are largely screened by trees, the site is visible from the surrounding grounds and may be visible from the upper windows of the residence. Views toward the site from the recreation facility are of

riparian trees within the nearby Coyote Creek corridor, grass-covered Tulare Hill, and open space areas at the facility. Visual Resources Figure 11 shows the view from KOP 7. Power transmission towers on Tulare Hill and to the north of the recreation facility are visible in views toward the project site.

The Coyote Creek bicycle and equestrian trails also run through the riparian corridor in this area. The bicycle trail is heavily used by recreationists and, to a lesser degree, by bicycle commuters. The equestrian trail receives far less use. Because the trails run mostly through and are on the east side of the riparian area, views of the project site are generally blocked by the dense riparian vegetation. There may, however, be some areas where the project site is visible from portions of the trails (Santa Clara County 2000), but generally the site would be in the middleground or background distance zones for views from these locations.

VISUAL SENSITIVITY

The project site is in the foreground distance zone of views by high numbers of recreationists that visit Coyote Ranch and have a high concern for visual quality. Also, the project site is visible in the foreground of views from the facility grounds by residents that live at and operate the recreation facility. For these reasons, visual sensitivity for views of the project site from Coyote Ranch is high. The project site does not appear to be visible from the county trail in the foreground distance zone.

VISUAL QUALITY

Views toward the project site from the recreation facility are dominated by the riparian trees within the nearby Coyote Creek corridor, the grass-covered Tulare Hill, and the open space areas in the near foreground at the facility. Power transmission towers on Tulare Hill and to the north of the recreation facility tend to slightly reduce the overall intactness, vividness, and unity of the moderately high quality views of natural forms and features. Most of the transmission towers closest to viewers at the facility are somewhat farther to the north and do not dominate the view toward the site. The towers at the base of and along the brow of Tulare Hill tend to reduce the intactness of the view slightly. Views from Coyote Ranch are dominated by scenes representative of the rural landscape character of the area and, within this context, are of moderately high visual quality.

FUTURE CONDITIONS

VISUAL SENSITIVITY AND QUALITY

Future visual sensitivity and quality for views of the project site from Coyote Ranch and the county trail would be similar to those described above for existing views.

VIEWS FROM SOUTHBOUND MONTEREY ROAD AND RAILROAD

EXISTING CONDITIONS

Monterey Road is a well-traveled thoroughfare running northwest and southeast through the Coyote Valley. Numbers of viewers traveling along Monterey Road are expected to increase substantially in the near future with development of the North

Coyote Valley Campus Industrial Area and urban reserve areas to the east and south. The project site is located within 150 feet of the road and is highly visible in foreground views for people traveling either north or south along the road. The site is also highly visible in foreground views, although for a brief duration, by train travelers.

Travelers heading south on Monterey Road and trains have foreground views of the project site as they transition from the more developed and suburban south Santa Clara Valley and Edenvale area through the Coyote Narrows and into the more rural and scenic Coyote Valley. Views toward the project site from the road vary as the viewer progresses south. The project site becomes visible for southbound travelers within their primary viewcone and immediately to their right as they pass the toe of Tulare Hill and begin to have more expansive views of the rural Coyote Valley.

Visual Resources Figure 12 is a view from KOP 8 looking south toward the project site for southbound travelers on Monterey Road just before the site becomes visible to the viewer. Visual Resources Figure 13 is a view looking south from Monterey Road for southbound travelers just after they pass the project site. For travelers on the road, the railroad berm generally screens views of dilapidated structures and debris on the northern portion of the project site; however, for train travelers, these elements are highly, although briefly, visible in foreground views.

VISUAL SENSITIVITY

The project site is in the foreground distance zone and partially within the primary view cone for views by high numbers of people traveling southbound on Monterey Road. The majority of travelers are assumed to be local workers, commuters, local area residents, and other people traveling for work, recreation, and leisure. This viewer group would have a moderate to moderately high awareness of and concern for visual quality and viewer sensitivity would be moderate to moderately high. Although the project site is fairly close to the road for passing viewers, it is not in the primary view cone for the more southern portion of the road where it is closest to the road. From the northern part of the road, the site is positioned within the primary view cone of travelers, but is largely screened by the base of Tulare Hill. As travelers approach the site from the north, some vegetation near the road tends to partially screen views of the site and reduce viewer awareness. The project site is visible intermittently for fairly short durations for southbound travelers on Monterey Road.

Although a large number of viewers with moderate to moderately high viewer sensitivity travel southbound on Monterey Road daily and the site is within the foreground distance zone, views are generally intermittent and of fairly short duration. For these reasons, visual sensitivity for southbound views of the project site is moderate.

Similarly, travelers on trains are primarily people commuting to and from work with moderate to moderately high awareness of and concern for visual quality. Although viewer sensitivity for passengers on these trains is moderate to moderately high and the project site is within the immediate foreground distance zone for views from

trains, views of the project site are of fairly short duration. Because views of the project site would be of fairly short duration and viewer sensitivity is moderate to moderately high, visual sensitivity for views of the site from southbound trains is moderate.

VISUAL QUALITY

Views south toward the project site from Monterey Road are of the grass-covered and rocky toe of Tulare Hill; the railroad grade cutting across the base of the hill; riparian trees and shrubs along Fisher Creek; the grove of large walnut and valley oak trees stretching across the project site; power lines extending across the road; several tall power transmission towers at the base of the hill near the road; and wood power poles and a billboard sign adjacent to the road. Various dilapidated structures and piles of building materials and debris on the northern portion of the project site are generally not visible from the road because these elements are screened from view by the railroad berm and some vegetation. These elements are, however, visible in the immediate foreground from passing trains.

Although views include natural forms and elements of the regional rural landscape, they also include a variety of discordant elements in proximity to viewers that reduce the intactness, unity, and vividness of these views. The more discordant visual elements appear early in the viewers' experience as they progress south past the toe of Tulare Hill. As the viewers continue south past the cut slope of the railroad, the transmission towers and lines, and the billboard, the views become increasingly more natural, unified, and intact. For train travelers, views of the northern portion of the project site include scattered shrubs, various dilapidated structures, and piles of building materials and debris and are generally low in intactness, unity, and vividness.

However, the area of North Coyote Valley that includes the project site is an important transition area, or visual gateway, for southbound viewers as they enter the rural and open valley from the more developed and urban areas of San Jose to the north. As southbound viewers traveling on either the road or railroad emerge from the Coyote Narrows into the North Coyote Valley and pass the grove of mature trees on the site, the visual quality of views across the southern portion of the project site improves substantially from moderately low to moderately high. Although the railroad berm screens views of the ground plane of the project site for southbound travelers on the road, the existing views across the southern portion of the site south of the central grove of trees include riparian trees, agricultural buildings, rural homes, and the Santa Teresa Hills in the middleground and background. For train travelers, these views also include open agricultural fields. For southerly views along this portion of Monterey Road and the railroad just south of the central grove of trees on the power plant site, the visual quality is moderately high.

FUTURE CONDITIONS

VISUAL SENSITIVITY

For likely future conditions, views from Monterey Road would be by substantially higher numbers of NCVCA workers and area residents with a moderately high concern for visual quality. Visual sensitivity for future southbound views from the road would therefore increase to moderately high because of the substantially higher numbers of viewers with moderately high viewer sensitivity. Future views from trains would continue to be of moderate visual sensitivity for similar reasons as described above.

VISUAL QUALITY

For likely future conditions, visual quality for views of the project site from southbound Monterey Road would be similar to those described above for existing views.

VIEWS FROM BASKING RIDGE AREA

EXISTING CONDITIONS

The Basking Ridge area is a fairly new residential subdivision located about 1½ miles north of the project site in the lower hills just east of Highway 101. Several homes in the southern part of the subdivision have views south toward the project site. Views south from this area are of the freeway, grassy open space areas adjacent to the freeway, the riparian corridor of Coyote Creek, Tulare Hill, transmission towers along the brow of the hill, and ridges and peaks of distant hills. Visual Resources Figure 14 shows the view from KOP 9.

VISUAL SENSITIVITY

Because views south from the Basking Ridge area are from residences with opportunities for long-duration views, viewer sensitivity is high. However, because the project site is in the middleground of views from this area, the visual sensitivity for these more distant views of the project site is moderately high.

VISUAL QUALITY

Views south from the Basking Ridge residential area include the natural forms of the trees massed along the Coyote Creek riparian corridor, the grass-covered slopes of Tulare Hill, ridges and peaks of distant hills, and grassy open space areas adjacent to the freeway. Transmission towers along the brow of the Tulare Hill are noticeable and reduce the intactness and unity of the view somewhat. However, the linear Highway 101 freeway in the near foreground contrasts strongly with the natural forms and also reduces the intactness and unity of views south toward the project site from this area. For views of the project site from the Basking Ridge residential area, vividness, intactness, and unity are moderate and visual quality is moderate.

FUTURE CONDITIONS

VISUAL SENSITIVITY AND QUALITY

For likely future conditions, visual sensitivity and quality for views of the project site from the Basking Ridge residential area would be similar to those described above for existing views.

VIEWS FROM FISHER CREEK CORRIDOR

EXISTING CONDITIONS

Fisher Creek forms the boundary along the west and north sides of the project site. The North Coyote Valley Campus Industrial Area Master Development Plan (City of San Jose 1985) identifies that a multiple-use trail for pedestrians, equestrians, and bicyclists would be developed along Fisher Creek in this area in the future. The Circulation diagram (City of San Jose 1985, p. 9) shows the bicycle trail running through approximately the middle of the project site with the pedestrian and equestrian portions following the creek channel to its intersection with the UPRR. The Scenic Routes and Trails Diagram in the San Jose 2020 General Plan (City of San Jose 1994b) also identifies a Trails and Pathways corridor along this portion of Fisher Creek. The City of San Jose has stated that the trail improvements “would be required regardless of General Plan designation” and are anticipated to be “made in conjunction with the development of the North Coyote Valley Campus Industrial Area” (City of San Jose 2000a, p. 2).

VISUAL SENSITIVITY

The land along this portion of the creek and proposed trail corridor is currently privately owned and not accessible to the public. Because of this, there are few if any viewers with views from this location and a description of visual sensitivity is not applicable for this baseline condition.

VISUAL QUALITY

Because the trail does not yet exist at this location, the visual quality of views from this KOP is described in detail below for the likely future condition. Based on the description below, the visual quality of views from this location for this baseline condition is low to moderately high.

FUTURE CONDITIONS

VISUAL SENSITIVITY

With development of the trail system along the creek corridor in the foreseeable future, the project site would be highly visible in immediate foreground views by high numbers of recreationists with high viewer sensitivity. For these reasons, with likely future conditions, visual sensitivity for views of the project site from the Fisher Creek corridor would be high.

VISUAL QUALITY

Views from the trail corridor that include the project site are variable in quality. Views of the project site from the trail corridor include open agricultural fields, rustic wood fences, the grove of large walnut and valley oak trees stretching across the project site, the natural forms of the riparian trees and shrubs along the corridor, the grass-covered slopes of Tulare Hill, ridges and peaks of the Silver Creek and Santa Teresa Hills, and other elements of natural and rural character (see Visual Resources Figures 15 and 16). Visual Resources Figure 15 shows the view from KOP 10. Many of the views from the trail corridor are of high intactness and vividness. However, some views that include the northern portion of the project site also include elements that substantially reduce the intactness, vividness, and unity of these views (see Visual Resources Figures 17 and 18). These elements include near views of power transmission towers; denuded and eroded creek banks; and dilapidated structures, junked cars, and debris currently on the northern portion of the project site.

For likely future conditions, visual quality for views that include the project site range from low to moderately high depending on the viewers' location and direction of travel along the trail corridor. However, for the portion of the trail corridor south of the central row of trees on the project site and north of Blanchard Road, views are and would continue to be of moderately high to high intactness and unity and moderately high vividness. For these reasons, visual quality of views for this portion of the trail is moderately high for both current and likely future conditions.

VIEWS FROM COYOTE VALLEY URBAN RESERVE

EXISTING CONDITIONS

The San Jose 2020 General Plan (City of San Jose 1994b) designates the Coyote Valley Urban Reserve as an area of land set aside for future urban development. Land uses in the reserve would include housing, schools, parks, commercial facilities, and other uses. The reserve consists of some lands just east of Monterey Road and south of Coyote Ranch Road as well as an extensive land area south of the designated campus industrial area. Several rural residences are currently located within the urban reserve area. Portions of the urban reserve lands are about ½-mile from the project site and extend south several miles. The majority of urban reserve lands are over 2 miles from the project site. Development of the urban reserve would be allowed only after building permits are issued for construction of facilities that would provide at least 5,000 new jobs in the campus industrial area. Issuance of building permits for construction of the proposed Cisco Systems headquarters within the campus industrial area would meet this requirement.

VISUAL SENSITIVITY

The urban reserve area has not yet been developed with the planned housing and commercial development. However, some existing rural residences with high viewer sensitivity are located in the south portion of the urban reserve area and have existing views north toward the project site. The project site would be in the

far middleground and background distance zones for views toward the site from in and around rural residences. For these reasons, visual sensitivity of views from existing rural residences in the urban reserve area is moderately high.

VISUAL QUALITY

Views north toward the project site from the urban reserve area are of open agricultural fields, Tulare Hill, the Silver Creek Hills, clusters of trees, and scattered farm complexes. Transmission towers along the brow of Tulare Hill are visible but not dominant elements of the views. The Metcalf Substation is partially visible in some views but is not dominant due to vegetation and topography that partially screens it and its position northeast of and away from the project site. Visual Resources Figure 19 shows the view from KOP 11 looking north toward the project site from an area of the urban reserve about 2 miles from the site. The character of existing views is rural and their visual quality is moderately high based on generally moderately high unity and intactness and moderate vividness.

FUTURE CONDITIONS

VISUAL SENSITIVITY

For likely future conditions, views north toward the project site would be from residences and businesses planned to be developed in the urban reserve area. Residential viewers with high viewer sensitivity would have long-duration views from in and around their homes. Although development of the campus industrial area between much of the urban reserve area and the project site could potentially screen views of the project site from residences, the project site may be visible from some future residences. Because the project site is in the middleground and background of views from this area, visual sensitivity is moderately high for future residences in the urban reserve area.

VISUAL QUALITY

For likely future conditions, views north toward the project site from the urban reserve area would be of moderately high visual quality for reasons described above. With development of the campus industrial area, the visual quality of views from this area would change from rural to high quality campus-like business commercial with buildings and extensive landscaping. Because the development is intended to be a cohesive and highly unified design with extensive landscaping, it would be moderately high in vividness, intactness and unity and the visual quality would continue to be moderately high.

CULTURAL RESOURCES

Testimony of Gary Reinoehl and Dorothy Torres

INTRODUCTION

This analysis discusses cultural resources, which are defined as the structural and cultural evidence of the history of human development and life on earth. Evidence of California's early occupation is becoming increasingly vulnerable due to the ongoing development and urbanization of the state.

Cultural resource materials may be found nearly anywhere in California: along the ocean coastline and on coastal islands; along rivers and streams; in coastal and inland valleys and lowlands; throughout the coastal and inland mountain ranges; and throughout the interior deserts. Cultural resources may be found on the ground or may be found at varying depths beneath the surface. In some areas of the state, a sequence of settlements on the same site may cover multiple layers of cultural resources. In other areas, the distribution of cultural materials may be much more dispersed and seemingly unrelated.

Cultural resources are significant to our understanding of our culture our history and heritage. Critical to the analysis of cultural resources are the spatial relationships between an undisturbed cultural resource site and the surface environmental resources and features, and the analysis of the locational context of the resource materials within the site and beneath the surface. These relationships provide information that can be used to piece together the sequence of human occupation and use of an area, and they begin to create a picture of the former inhabitants and their environment.

Staff's primary concerns in its cultural resource analysis are to ensure that all potential impacts are identified and that conditions are set forth that ensure no significant adverse impacts will occur. Three aspects of cultural resources are addressed in staff's analysis: prehistoric archaeological resources, historic archaeological resources, and ethnographic resources.

Prehistoric archaeological resources are those materials relating to prehistoric human occupation and use of an area; these resources may include sites and deposits, structures, artifacts, rock art, trails, and other traces of Native American human behavior. In California, the prehistoric period began over 10,000 years ago and extended through the 18th century when the first Euro-American explorers settled in California.

Historic archaeological resources are those materials usually associated with Euro-American exploration and settlement of an area and the beginning of a written historical record; they may include archaeological deposits, sites, structures, traveled ways, artifacts, documents, or other evidence of human activity. Under federal and state requirements, cultural resources must be greater than fifty years old to be considered of potential historical importance.

Ethnographic resources are those materials important to the heritage of a particular ethnic or cultural group, such as Native Americans, African, European, or Asian immigrants. They may include traditional resource collecting areas, ceremonial site, topographic features, cemeteries, shrines, or ethnic neighborhoods and structures.

LAWS, ORDINANCES, REGULATIONS, AND STANDARDS (LORS)

Cultural resources are indirectly protected under provisions of the federal Antiquities Act of 1906 (Title 16, United States Code, Section 431 et seq.) and subsequent related legislation, policies, and enacting responsibilities, e.g., federal agency regulations and guidelines for implementation of the Antiquities Act. The following laws, ordinances, regulations, standards, and policies apply to the protection of cultural resources in California. Projects licensed by the Energy Commission are reviewed to ensure compliance with these laws.

FEDERAL

- National Environmental Policy Act (NEPA): Title 42, United States code, section 4321-et seq., requires federal agencies to consider potential environmental impacts of projects with federal involvement and to consider appropriate mitigation measures.
- Federal Register 44739-44738, 190 (September 30, 1983): Federal Guidelines for Historic Preservation Projects: The US Secretary of the Interior has published a set of Standards and Guidelines for Archaeology and Historic Preservation. These are considered to be the appropriate professional methods and techniques for the preservation of archaeological and historic properties. The Secretary's standards and guidelines are used by federal agencies, such as the Forest Service, the Bureau of Land Management, and the National Park Service. The State Historic Preservation Office refers to these standards in its requirements for selection of qualified personnel and in the mitigation of potential impacts to cultural resources on public lands in California.
- National Historic Preservation Act, 16 USC 470, commonly referred to as Section 106, requires federal agencies to take into account the effects of their undertakings on historic properties through consultations beginning at the early stages of project planning. Regulations revised in 1997 (36 CFR Part 800 et. seq.) set forth procedures to be followed for determining eligibility for nomination, the nomination, and the listing of cultural resources in the National Register of Historic Places (NRHP). The eligibility criteria and the process are used by federal, state, and local agencies in the evaluation of the significance of cultural resources. Very similar criteria and procedures are used by the state in identifying cultural resources eligible for listing in the State Register of Historic Resources. Recent revisions to Section 106 in 1999 emphasized the importance of Native American consultation.
- Executive Order 11593, "Protection of the Cultural Environment," May 13, 1971 (36 Federal Register 8921) orders the protection and enhancement of the

cultural environment through providing leadership, establishing state offices of historic preservation, and developing criteria for assessing resource values.

- American Indian Religious Freedom Act; Title 42, United States Code, Section 1996 protects Native American religious practices, ethnic heritage sites, and land uses.
- Native American Graves Protection and Repatriation Act (1990); Title 25, United States Code Section 3001, et seq. Defines “cultural items”, “sacred objects”, and “objects of cultural patrimony”; establishes an ownership hierarchy; provides for review; allows excavation of human remains, but stipulates return of the remains according to ownership; sets penalties; calls for inventories; and provides for the return of specified cultural items.

STATE

- Public Resources Code, Section 5020.1 defines several terms, including the following:

(j) “historical resource” includes, but is not limited to, any object, building, structure, site, area, place, record, or manuscript which is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political, military, or cultural annals of California.

(q) “substantial adverse change” means demolition, destruction, relocation, or alteration such that the significance of an historical resource would be impaired.

- Public Resources Code, Section 5024.1 establishes a California Register of Historic Places; sets forth criteria to determine significance; defines eligible properties; and lists nomination procedures.
- Public Resources Code, Section 5097.5 states that any unauthorized removal or destruction of archaeological or paleontological resources on sites located on public land is a misdemeanor. As used in this section, “public lands” means lands owned by, or under the jurisdiction of, the state, or any city, county, district, authority, or public corporation, or any agency thereof.
- Public Resources Code, Section 5097.98 defines procedures for notification of discovery of Native American artifacts or remains and for the disposition of such materials.
- Public Resources Code, Section 5097.99 prohibits obtaining or possessing Native American artifacts or human remains taken from a grave or cairn and sets penalties for these actions.
- Public Resources Code, Section 5097.991 states that it is the policy of the state that Native American remains and associated grave artifacts shall be repatriated.

- Public Resources code, Section 21000, et seq, California Environmental Quality Act (CEQA) This act requires the analysis of potential environmental impacts of proposed projects and requires application of feasible mitigation measures.
- Public Resources Code, Section 21083.2 states that if a project may affect a resource that has not met the definition of an historical resource set forth in section 21084, then the lead agency may determine whether a project may have a significant effect on “unique” archaeological resources; if so, an EIR shall address these resources. If a potential for damage to unique archaeological resources can be demonstrated, such resources must be avoided; if they can not be avoided mitigation measures shall be required. The law also discusses excavation as mitigation; discussed the costs of mitigation for several types of projects; sets time frames for excavation; defines “unique and non-unique archaeological resources; provides for mitigation of unexpected resources; and sets financial limitations for this section.
- Public Resources Code, Section 21084.1 indicates that a project may have a significant effect on the environment if it causes a substantial adverse change in the significance of a historic resource; the section further defines a “historic resource” and describes what constitutes a “significant” historic resource.
- CEQA guidelines, Title 14, California Code of Regulations, Section 15126.4 “Consideration and Discussion of Mitigation Measures Proposed to Minimize Significant Effects” sub-section (b) discusses impacts of maintenance, repair, stabilization, restoration, conservation, or reconstruction of a historical resource. Subsection (b) also discusses mitigation through avoidance of damaging effects on any historical resource of an archaeological nature, preferably by preservation in place, or by data recovery through excavation if avoidance or preservation in place is not feasible. Data recovery must be conducted in accordance with an adopted data recovery plan.
- CEQA Guidelines, Title 14, California Code of Regulation, Section 15064.5 “Determining the Significance of Impacts to Archaeological and Historical Resources”. Subsection (a) defines the term “historical resources.” Subsection (b) explains when a project may be deemed to have a significant effect on historic resources and defines terms used in describing those situations. Subsection (c) describes CEQAs’ applicability to archaeological sites and provides a bridge between the application of the terms “historic” resources and a “unique” archaeological resource.”
- CEQA Guidelines, Title 14 California Code of Regulations, Section 15064.7 “Thresholds of Significance.” This section encourages agencies to develop thresholds of significance to be used in determining potential impacts and defines the term “cumulatively significant.”
- CEQA Guidelines, Appendix “G” Issue V: Cultural Resources. Lists four questions to be answered in determining the potential for a project to impact archaeological, historic, and paleontologic resources.

- California Penal Code, Section 622.5. Anyone who willfully damages an object or thing of archaeological or historic interest can be found guilty of a misdemeanor.
- California Health and Safety Code, Section 7050.5. If human remains are discovered during construction, the project owner is required to contact the county coroner.
- Public Resources Code, Section 5097.98. If the county coroner determines that the remains are Native American, the coroner is required to contact the Native American Heritage Commission, which is then required to determine the “Most Likely Descendant” to inspect the burial and to make recommendations for treatment or disposition of the remains and any associated burial items.

LOCAL

The Energy Commission typically assures compliance with local laws, ordinances, regulations, standards plans and policies. The General Plans of the County of Santa Clara and the City of San Jose are addressed below because the project site would occupy approximately 10 acres in the county and 10 acres in the city (Calpine/Bechtel 1999a, p. ES-1).

SANTA CLARA COUNTY

The County of Santa Clara’s General Plan defines two types of heritage resources, natural and man-made. Both types of resources deserve special protection to preserve them for future generations. The kinds of resources termed heritage resources are: historical sites, structures, and areas; archeological and paleontological sites and artifacts; and historical and specimen trees (SCCGP 1999b, p. H-36).

The County regards heritage resources as important due to a variety of factors. The resources are important because they may prove to be potentially scientifically valuable or possess cultural and historical value and “place” value. These resources provide a sense of place that defines and distinguishes Santa Clara County from all other places.

According to Santa Clara County, heritage resources should be considered the birthright of successive generations and if integrated with new development, heritage resources will immeasurably enrich the experience of urban and rural landscapes. Santa Clara County’s approach to protecting heritage resources is threefold. The County will do the following:

- Inventory and evaluate heritage resources;
- Prevent or minimize adverse Impacts on heritage resources; and
- Restore, enhance, and commemorate resources.

Santa Clara County seeks first to preserve, restore, and commemorate heritage resources of greatest value and secondly to preserve as much of the heritage value of a resource as possible (SC 1999b, p. H-37).

CITY OF SAN JOSE

The General Plan of the City of San Jose asserts that the City has a long colorful heritage that is valuable in adding to a sense of community identity. The City of San Jose seeks to do this by promoting an awareness of San Jose's historic and archaeological heritage.

The City's goal is preservation of historically and archaeologically significant structures, sites, districts and artifacts. The City has developed an eleven-point plan that illustrates the City's policy:

1. Preservation of irreplaceable historic and archaeological resources should be a key consideration in the development review process.
2. The City should use the Area of Historic Sensitivity overlay and landmark designation process to promote and enhance the preservation process.
3. An inventory of significant structures should be maintained and promoted.
4. Areas of numerous significant sites or structures should be considered for inclusion and preservation as Historic Preservation Districts.
5. New development should be designed to be compatible with nearby designated historic resources.
6. The City should foster rehabilitation of buildings and offer financial incentives to assist in the rehabilitation.
7. Historic structures proposed for demolition should be considered for relocation.
8. The City requires archaeologically sensitive areas be investigated during the planning process and appropriate mitigation efforts should be incorporated into the project design.
9. If Native American burials are encountered during construction, development activity should cease until examination and reburial in an appropriate manner is accomplished.
10. Heritage trees should be maintained and protected in a healthy state.
11. The City should encourage the appropriate Federal and State programs that provide tax and other incentives for preservation of resources (SJ 1999b, pp. 83-85).

ENVIRONMENTAL SETTING

REGIONAL DESCRIPTION

Santa Clara Valley lies between the Santa Cruz Mountains to the west and the Diablo Range to the east. It is an area of complex geology and many seismic faults (Calpine/Bechtel 1999a, p. 8.15-1). The area's climate is Mediterranean and this temperate climate has afforded the development of numerous species, diverse habitats, and recreational resources (Calpine/Bechtel 1999a, p. 8.2-1). Santa Clara County encompasses 1,300 square miles and is located at the southern end of San

Francisco Bay (Calpine/Bechtel 1999a, p. 8.4-1). The topography of the Coyote Valley area consists of a series of narrow elongated valleys rimmed by adjoining ridges. The northern part of the area is an open flat valley representative of the bay-estuary-coastal plain transition that merges with the San Francisco Peninsula geographic region.

PROJECT VICINITY DESCRIPTION

The project site is located just west of Monterey Road, between Metcalf Road to the north and Blanchard Road to the south. The site of the proposed Metcalf Energy Center is located in a narrow valley, approximately 8 miles long by 3 miles wide, (Calpine/Bechtel 1999a, p. 8.14-1) drained by Coyote Creek. Much of the valley is rural or in agricultural production. Just beyond Tulare Hill, which rises to the northwest of the project, there are numerous residential areas located just over one half mile from the proposed project. The area contains many habitats and has long been a desirable habitation site for human occupants. The project vicinity is the location of several sites important to the understanding of the pre-history of California (Daniel et.al. 1983; Calpine/Bechtel 1999b, p. 8.3-3).

There are two creeks in the immediate vicinity of MEC. The levees of Fisher Creek, the smaller of the two, constitute the western and northern boundaries of the project site (Calpine/Bechtel 1999a, p. 8.14-2). Fisher Creek flows into Coyote Creek approximated 500 feet north east of the project site. A floodplain exists in the area of Coyote Creek, making the likelihood of encountering intact resources underneath silt deposited by floods moderately high (Calpine/Bechtel 1999a, p8.3-4).

Refer to the **PROJECT DESCRIPTION** section of this Final Staff Assessment for additional information and maps of the project development region and the project area.

PREHISTORIC SETTING

Archaeological literature indicates that early residents of California typically lived near water sources that could provide them with access to a wide variety of plant and animal resources. The Santa Clara Valley was supplied by Coyote Creek and other smaller seasonal sources of water. Although traces of human occupation provide evidence for habitation in this area for at least 11,500 years, it is likely that rising seas and deposits of sediments in the area hide sites that date back approximately 15,000 years (Calpine/Bechtel 1999b, p. 8.3-4).

ETHNOGRAPHIC BACKGROUND

Authorities disagree concerning the existence and location of previous Native American villages in the Coyote Valley. However, they do agree that there were numerous villages or seasonal camps, used to exploit seasonal resources, in or near the project area. At the time of Spanish contact in 1770, the Costanoan people (also known as Ohlone) inhabited the area that extended from the central California Coast east to the Diablo Range. The triblet that occupied the vicinity of the project site was known as the Tamyen (Tamien). Spanish mission records and archaeological data indicate that in 1770 there appear to have been 1,000 to 1,200 Tamyen living in the area. The Tamyen were broken down into additional tribelets.

The area of the San Juan Bautista Tribelet corresponds roughly with that of the project. Sources differ as to whether the Coyote Valley was an area where permanent villages were established, but it is likely that the area was at least the location of temporary campsites over hundreds of years (Calpine/Bechtel 1999b, p. 8.3-7).

HISTORIC SETTING

Spanish missionaries began their exploration and development of the missions in California in 1769 starting in San Diego and ending with the missions in San Rafael and Sonoma, in 1823. It is not possible to accurately trace the exact routes of Spanish missionaries in California, but it is likely that many of them passed through the project area. Mission Santa Clara would have been the most likely source of impact on the indigenous people of the valley. The AFC divides the historic period of Santa Clara Valley into three periods: the Spanish period which extended from 1760 to 1821, the Mexican Period spanning 1821 to 1848; and the American Period beginning in 1848 and continuing to the present (Calpine/Bechtel 1999a, p. 8.3-8).

RESOURCES INVENTORY

LITERATURE AND RECORDS SEARCH

Prior to preparation of the AFC, consultants to the applicant conducted a literature search and reviewed site records and maps at the Northwest Information Center of the California Historical Resources Information System (CHRIS). Although the applicant did not define the dimensions of the Area of Potential Effect (APE), the literature search which included the project APE and areas within one-mile of the APE, indicated that numerous surveys had been previously conducted in the area (Calpine/Bechtel 1999b, p8.3-9). For the field survey, the consultant to the applicant chose to survey an area within 75 feet on each side the center line of proposed linear facilities (a 150 foot corridor) where feasible and appropriate (Calpine/Bechtel, 1999b, p. 8.3-20). For the scope of staff's analysis, the 75 foot measurement shall define the APE for the project site and all the linear facilities. The record search revealed that 136 cultural resource studies have been conducted within the project APE and/or a one-mile radius of the power plant site area and project linears.

A member of the public raised a question regarding whether the information provided as a result of the cultural resource records search was current. Staff verified that the information was current. Staff contacted Dr. James Bard, cultural resource consultant to the applicant. Dr. Bard provided invoice numbers from the CHRIS so that the information could be verified. On May 31, 2000, staff contacted Leigh Jordan, Coordinator of the CHRIS Northwest Information Center, Sonoma. Staff verified the invoice numbers with the records maintained at the CHRIS. The CHRIS records indicated that the CHRIS conducted a records search and provided cultural resource information to Dr. Bard regarding the Calpine/Bechtel MEC site and vicinity shortly after the requests were initiated on January 26, February 18, and March 1, 1999 (Bard 2000a; Jordan 2000; Calpine/Bechtel 1999a, p. 8.3-9).

FIELD SURVEYS

A pedestrian field survey of selected MEC project elements was conducted on March 8 and 9, 1999, by Dr. James C. Bard and Mr. Robin McClintock using 10-meter intervals between survey transects. This intensive survey was performed on the proposed plant site location and a strip of land immediately adjacent to the south of the proposed site. Where feasible and appropriate, 75 feet on each side of linear centerlines was surveyed. The proposed and alternative access roads, water lines that are no longer proposed routes, transmission line, transmission line Alternative 1, and gas line segments 1,2,3,4, and 5 were also surveyed (Calpine/Bechtel 1999b, p. 8.3-20). Two discrete archaeological loci were identified on the project site. Subsequent backhoe trenching did not reveal a subsurface component to these loci (Calpine/Bechtel 1999k, Confidential Attachment CR-35, p. 21).

During the initial cultural resources survey on March 8 and 9 1999, the project team did not observe any potentially significant historic buildings or structures within the proposed MEC plant site, or along the access road, domestic water line, recycled water line, electrical transmission, or gas line routes (Calpine/Bechtel 1999b, p. 8.3-22). However, there are properties in the vicinity of the project that may have historic importance. The potential historic resources are a water tower, depot, and feed and grain warehouse located between Monterey Road and the Union Pacific Railroad (UPRR) tracks that may be eligible for listing in the NRHP as a Historic District. The Ramelli Ranch, north of Sobrato Internal Road and east of Monterey Road, appears to be NRHP eligible as a complex. In addition, the Lester Farm complex and the former Encinal School may each be NRHP eligible. None of these structures will be impacted by the project (Calpine/Bechtel 1999b, p. 8.3-20).

Coyote Ranch, an NRHP eligible site is located approximately ½ mile from the proposed MEC project site. The City of San Jose has raised questions concerning potential impacts to this site. The question of potential impacts to Coyote Ranch is addressed in the Impacts section of this staff assessment.

The Keesling black walnut trees are San Jose City heritage trees. They were originally planted in the early 1900s. These trees occur in the unpaved area between the UPRR tracks and the west side of Monterey Road from Capital Expressway to Gilroy (Calpine/Bechtel 2000b, p. 3-3).

POWER PLANT SITE AND IMMEDIATE LINEAR FACILITY ROUTES

The proposed MEC site is located in the Coyote Valley. Due to the presence of sheds, chicken coops and debris on the site, ground visibility at the proposed plant site was fair to poor during the survey. There was also evidence of fill and garbage dumping (Calpine/Bechtel 1999b, p. 8.3-21).

Basin Research conducted presence absence testing in August 1999. The testing focused on Area 1 (North), including the proposed location of the generation plant and support facilities. Area 2 (South) is basically the route of the proposed access road and probable utility corridor. Area 3 is defined as two discrete loci in the immediate vicinity of Fisher Creek. The presence absence testing consisted of 24

backhoe test units (BTU). The actual trenches averaged approximately 2 feet wide and 5-10 feet long by 6 feet deep (Calpine/Bechtel 1999k, Confidential Attachment CR-35 p. 21).

The backhoe trenching revealed only culturally sterile soil in Test Areas 1 and 2. In Test Area 3, backhoe trenching did not reveal any cultural materials, but the cultural resources consultant stated that the area's proximity to Fisher Creek and the presence of minor surface cultural material warranted monitoring in this area.

PROPOSED NATURAL GAS LINE

The proposed natural gas line is identified in the AFC as segments 1,3, and 4. The route is approximately one mile long and the line would tie into a PG&E main pipeline east of Highway 101. Segment one is located at the eastern end of the alignment. Visibility was fair and there was evidence of activity by off road vehicles. The consultant to the applicant identified an unnaturally lumpy ground surface that appeared to indicate the presence of fill. Visibility was poor the along the route of Segment 3. There was heavy vegetation and evidence of rodent burrows. Along segment four, only railway fill was identified.

A gas metering station will be located immediately adjacent to PG&E's line 300A, just east of Malech Road and south of the county road that intersects Malech Road. The area of the metering station will be approximately 35 feet by 80 feet and that places it inside area previously surveyed for the natural gas line (Calpine/Bechtel 2000d, p.1).

MEC WATER SYSTEMS

In October 1999, the applicant provided Supplement A that identified a proposed water route identified as the South Bay Water Recycling (SBWR) route (Calpine/Bechtel 1999e, p. 1). Prior to the filing of Supplement A in August 1999, Robin McClintock of CH2MHill conducted a survey of portions of this route that had not been previously surveyed. Access to several undeveloped agricultural land parcels between Great Oaks and Highway 85 along Via Del Oro was not obtained. In addition, the surveyor was not able to obtain access to a portion of segment B-3 referred to as the "elbow." Previously recorded sites were not relocated during this survey and no new sites were identified. (Calpine/Bechtel 1999e, p. 3-4).

A potable water line from Well No. 23 runs parallel to the UPRR tracks, approximately 2,500 feet south of the plant site. This line was surveyed because it was the previously proposed route. Fill associated with railroad activities obscured much of the native ground surface. During the survey, no cultural materials that appeared likely to be eligible for listing on the NRHP were observed by Robin McClintock of CH2MHill.

An additional potable water line may be located 3,000 feet southwest of the proposed project. A pipeline from this west wellhead would extend north to the alignment of the SBWR route (Calpine/Bechtel 2000e, p. 1). The area for this waterline was not surveyed as part of the MEC project. However, a cultural resources inventory was provided by Basin Research and David J. Powers and

Associates as part of the documentation used by the City of San Jose to prepare the Draft Environmental Impact Report Coyote Valley Research Park Volume I and Volume III Technical Appendices. Appendix K in Volume III is a Historic Evaluation Report, compiled for Basin Research Associates and David J. Powers and Associates by Ward Hill, Architectural Historian (SJ 2000a).

The area of the Coyote Valley Research Park (CVRP) addressed in the Cultural Resources Inventory consists of the following area. The CVRP site is situated west of US 101 and Coyote Creek and immediately south of Tulare Hill. The site is bounded by Bailey Avenue on the south; the Santa Teresa Hills on the west and north, and the Union Pacific Railroad tracks on the east (SJ 2000, p. 1). This area is included in the area covered by the cultural resources inventory which covers the North Coyote General Plan Amendment Area located in the City of San Jose and adjacent to unincorporated area of Santa Clara County (Basin 1998, p. 1).

The information provided in the reports generated for the CVRP indicated that there was one previously identified cultural resource within the area that might be impacted by the proposed potable water wells. Blanchard Road Houses A & B, according to Architectural Historian, Ward Hill, do not appear to be eligible for the California or National Registers because they do not appear to be significant under Criteria A, B or C. In addition, neither house A or B appears to be eligible for the California or National Register because they lack integrity. Neither house appears to be eligible for listing as a "Structure of Merit" on the City of San Jose Historic Resources Inventory due to low scores on the City of San Jose Historic Evaluation Criteria checklist (SJ 2000a).

ACCESS ROADS

The proposed access road would be 0.25 mile in length and would cross the UPRR tracks and then run northwest to the plant site (Calpine/Bechtel 1999, Confidential Attachment CR-35, p.30). The area of the proposed access road was subjected to presence/absence testing (Area 2) and only culturally sterile soil was revealed.

The proposed Western Access Road would be located in areas covered by the records search and survey conducted for the MEC project. A small portion of the proposed road would extend south of Blanchard Road. The southern portion of the proposed access road was addressed in the Cultural Resources inventory completed by Basin Research for the CVRP. Most of the roadway lies north of Blanchard Road. The northern section of the proposed road was subject to presence absence testing in August 1999. The preponderance of the 1,500 foot long road will be situated north of Blanchard Road. in an area referenced in the "Archaeological Presence Absence Testing Program" as Area 3. Although no resources were discovered during the testing program, the applicant recommends monitoring in this area due to the presence of three surface loci and the road's proximity to Fisher Creek.

ELECTRIC TRANSMISSION LINE

The applicant estimates that 200 feet of new 230kv transmission line would be necessary and no new power poles will be required (Calpine/Bechtel, 1999a, p. 2-1). The electric transmission line lies within the area surveyed for the plant site.

NATIVE AMERICAN CONTACTS

In January, February, and March of 1999, the consultant to the applicant contacted the Native American Heritage Commission (NAHC). This contact with the NAHC, and an inquiry to the Northwest Information Center of the California Historic Resources Information System (CHRIS), failed to identify the location of any traditional Native American cultural properties in the project area. The applicant sent letters to representatives of the Native American community on March 22, 1999, but no responses were received (Calpine/Bechtel 1999a, p. 8.3-22; Bard, personal communication January 28, 2000).

Staff obtained a list from the NAHC of representatives of the Native American community who wished to be notified regarding any construction-related disturbances in Santa Clara County. Twelve individuals or organizations identified on the list were sent a letter, dated February 9, 2000, inviting them to a meeting on February 15, 2000. Staff also telephoned every individual or organization on the list from the NAHC. Some telephone numbers were not in service. The meeting was an outreach effort on the part to the Energy Commission designed to specifically address the areas of Environmental Justice and Cultural Resources.

Four representatives of the Native American community (Ohlone/Costanoan) attended the meeting and one person, who was unable to attend, telephoned. All in attendance expressed concern over the archaeological sensitivity of the area. Several stated that they had acted as monitors at sites in the vicinity of the project where human remains were unearthed. They also expressed concern over the potential for discovering human remains in the vicinity of MEC (CEC 2000m).

SUMMARY OF PREVIOUSLY IDENTIFIED CULTURAL RESOURCES IN THE PROJECT VICINITY

Forty-four prehistoric and historic resources have previously been identified within one mile of the proposed MEC project site (Calpine/Bechtel 1999b, p. 8.4-11). Five of these cultural resources have been determined eligible to the NRHP. Some of the prehistoric sites have been identified as habitation sites and several have contained Native American burials. The age of some of the sites may date as far back as 10,000 years before present (b.p.). Cultural resource sites in the Coyote Valley are both numerous and important and signal a potential for additional undiscovered resources in the project vicinity, therefore, making this area archaeologically sensitive. The City of San Jose commissioned a Cultural Resource Assessment for the adjacent CVRP project because the area is archaeologically sensitive (SJ 2000a, p. 165).

IMPACTS

Since project development and construction usually entail surface and sub-surface disturbance of the ground, the proposed MEC project has the potential to adversely affect both known and previously unknown cultural resources. Direct impacts are those which may result from the immediate disturbance of resources, whether from vegetation removal, vehicle travel over the surface, earth-moving activities, or excavation. Indirect impacts are those which may result from increased erosion due to site clearance and preparation, or from inadvertent damage or outright vandalism to exposed resource materials due to improved accessibility. Cumulative impacts to cultural resources may occur if increasing amounts of land are cleared and disturbed for the development of multiple projects in the same vicinity as the proposed project.

The potential for the project to cause impacts to cultural resources is related to the likelihood that such resources are present and whether they are actually encountered during project development and construction activities. Although the existence of known cultural resources indicates further potential for unknown resources to be encountered, the absence of known resources does not necessarily mean that unknown resources will not be encountered and that impacts will therefore not occur. In addition, the potential for discovery does not measure the significance of individual artifacts or other cultural resources present, since it is impossible to accurately predict what specific materials could be encountered. Furthermore, sometimes the full significance of discovered cultural resources can only be determined after they have been collected, prepared, and studied by professional archaeologists.

POTENTIAL FOR PROJECT IMPACTS

Because project-related site development and construction would entail sub-surface disturbance of the ground, the proposed project has the potential to adversely affect previously unknown cultural resources. Forty-four archaeological sites, features, or objects are known to be located within one mile of the proposed project. One of the NRHP eligible sites within one mile of the proposed project site appears to be one of the oldest sites in western California (Morrato 1984, p. 110). These sites include historic-era buildings. The presence of numerous sites indicates a high potential for previously unknown historic and prehistoric resources to be encountered and affected during project construction.

POWER PLANT SITE AND LAYDOWN AREA

Approximately 14 fenced acres for project facilities and an additional 6 acres for a laydown area, totaling 20 acres, are likely to be disturbed by the project (Calpine/Bechtel 1999a, p. 8.3-4). Excavations for project site foundations will be typically less than 5 feet. Excavations for the circulation water pump would extend to approximately 18 feet below the final surface grade (Calpine/Bechtel 1999h, p. 38).

A storm water retention basin would be constructed in the southwest corner of the project site outside the riparian corridor setback area. Construction of the basin

would include a storm water drainpipe under the existing levee into Fisher Creek. The basin would be located within the project site. Construction of the drain would trigger Section 404 of the Clean Water Act of 1977 (33 USC 1251 et seq., 33 CFR Section 320 and 323). This Section will require the applicant to obtain a permit from the US Army Corps of Engineers (USACE) before construction occurs near wetlands areas (Calpine/Bechtel 2000b, p. 3-15; Calpine/Bechtel 2000b, Attachment BR-26R, p. 4-3).

The City of San Jose has noted that the NRHP eligible Coyote Ranch is located within ½ mile of the proposed project site. The City raised the question of possible air quality impacts including the effects of steam vapor emissions/condensation on this cultural resource (SJ 1999a, p. 9). Potential project emissions appropriate to examine in this context are the projects contributions to acid rain and vapor emissions. The **Air Quality** portion of this Final Staff Assessment has determined that emissions from MEC will not contribute to the formation of acid rain. Furthermore, the amount of moisture contributed to the vicinity of Coyote Ranch, by the project will contribute an amount of moisture equal to 0.34 inches of rainfall per year. This is a negligible amount of moisture. (Loyer 2000, personal communication).

There are 44 previously recorded archaeological sites within one mile of MEC. Some of the sites contained Native American burials. CA-SCL-178 may be the oldest identified site in western California. Sites in the Coyote Valley area are both numerous and important, therefore, Coyote Valley archaeologically sensitive area. It is likely that erosion from Tulare Hill, immediately to the northeast, and sediment from flooding of Coyote or Fisher Creeks may have buried archaeological sites within the project area.

As described in the AFC, there are no previously recorded cultural resources sites present within the project site or laydown area. Preliminary surveys for the project identified two archaeological loci. Later, presence/absence testing (24 backhoe trenches) identified the north area of the project site and the area surrounding the proposed access road as culturally sterile. Although no resources were identified in the third area surveyed, because some minor surface material was previously identified in the southern portion of the project site (north of Blanchard Road.), the applicant recommends archaeological monitoring in that portion of the site (Calpine/Bechtel 1999k, Confidential Attachment CR-35, p. 21).

The Keesling black walnut trees, located from Capitol Expressway to the MEC project site south of Metcalf Road and south of the MEC site to the town of Gilroy, were planted originally by Horace G. Keesling. The trees were designated as a point of historical interest by the State of California in 1980. They line the west side of Monterey Highway and would not be affected by the proposed project (Calpine/Bechtel 1998b, p. 8.3-20).

ELECTRICAL TRANSMISSION LINE

The electric transmission line would be approximately 240 feet long and would connect with an existing PG&E transmission line. Since the transmission line route

is located within an area of the project where new transmission poles would not be necessary and backhoe trenching did not reveal any cultural resources in the area, no impact is anticipated (Calpine/Bechtel 1999k, Confidential Attachment CR-35 pp. 21-22; Calpine/Bechtel 2000f).

NATURAL GAS PIPELINE

The proposed natural gas line would extend 5,250 feet from the plant site to PG&E's main natural gas pipeline. This line is designated in the AFC as Segment 1,3, and 4 (Calpine/Bechtel 1999a, p. 6-1). Earth disturbance necessary for construction of the pipeline would primarily involve a combination of trenching, boring, and horizontal directional drilling. Trenching would consist of digging a three to seven foot wide trench to enclose a 16-inch pipe that would be buried at least 36 inches under the earth. The trench for the natural gas line would vary in depth from approximately 5 feet under existing roads to 8 feet adjacent to the railroad right-of-way. The width of the trench would be 3 feet in existing roadways and up to 20 feet in open land (Calpine/Bechtel 1999h, p. 41). Boring would be used where it is necessary for the natural gas pipeline to cross under something such as a road or canal for a short distance. The boring process necessitates the digging of boring pits on each side of the crossing and then using an auger or ramming device to "jack" the pipe into place. Horizontal directional drilling is a more expensive method of spanning undercrossings. A pilot hole is drilled and then enlarged with a reaming device until the size is sufficient to accommodate the pipe. The boring pits required at each end of the bored and horizontally directionally drilled segments will be 5 feet to 10 feet deep and approximately 10 feet by 30 feet in area (Calpine/Bechtel 1999a, pp. 6-1 to 6-5).

Pacific Gas and Electric (PG&E) would own and operate a metering facility. The facility would measure the gas supply to MEC. The metering station would be approximately 35 feet by 80 feet. (Calpine/Bechtel 1999a, p. 6-5, Calpine/Bechtel 2000b, p. 2-1; Calpine/Bechtel 2000, p.1). Construction of the metering station would necessitate grading an area approximately 80 by 150 feet. Grading would also be necessary for construction of a very short (length not specified) access road which will extend from a county road located to the north of the proposed metering station (Calpine/Bechtel 2000d, p.1-2). It would be constructed at the point of interconnection with the proposed natural gas line and PG&E's Line 300A. Preparation of the site will involve grading an area approximately 80 feet by 150 feet and a short 20 foot wide access road (Calpine/Bechtel 2000d, p.1). The area of the proposed metering station is within the area surveyed for the natural gas line and it does not appear that any resources would be impacted.

Three cultural resources sites, two of them NRHP eligible, are located close to the proposed natural gas line and PG&E metering station. It does not appear that any of these resources would be impacted, however presence/absence testing and monitoring would be required to ensure there are no impacts to previously undiscovered buried cultural resources (Calpine/Bechtel 1999b, Fig8.3-4b). Prior to initiating boring activity under Highway 101 it will be necessary for the applicant to obtain an encroachment permit from California Department of Transportation (Caltrans), (Calpine/Bechtel 1999a, p. 8.3-34).

WATER LINES

The proposed South Bay Water Recycling (SBWR) route would extend approximately 10.2 miles primarily along paved city streets and through residential and commercial areas. The three pipelines would extend from MEC on the south side of Fisher Creek to connect with the Santa Teresa Boulevard. Junction would be constructed using an open-cut trench method through this agricultural area (Calpine/Bechtel 1999e, p. 3-1).

The SBWR route is primarily a modification of the Snell Avenue/Santa Teresa Boulevard Route that incorporates some of the segments that were part of the Union Pacific Railroad (UPRR) route previously identified in the AFC. The proposed SBWR route begins at the intersection of Sylvandale and Senter Roads north of the proposed power plant site, then follows a route approximately 10 miles long. More than one-third of the route extends through city streets. Segment B-3 of this proposed route would contain the water supply pipeline, the domestic water line, and the industrial waste water line. The necessary construction corridor for these three lines may be as wide as 66 feet (Calpine/Bechtel 1999e, p. 2-3). Previously recorded sites CA-SCL-249 and CA-SCL-250 appear to be directly in the path of the proposed route (Calpine/Bechtel 1999b, Confidential Figures 8.3-4a and 8.3-4b).

There are several areas on the SBWR route where access to land for a survey could not be obtained by the applicant's consultant. It is also likely that trenching for this line would exceed the depth of previously disturbed soil. According to Data Response set 3B, since these sites were first identified there has been considerable development in the area. CA-SCL-249 could not be relocated and CA-SCL 250 would not have qualified as eligible for listing in the NRHP, even when it was originally discovered. These sites were revisited after development and only a single chipped chert flake was found. Therefore, impacts to previously unknown cultural resources are possible in this sensitive area, but impacts to known resources are not likely.

Calpine/Bechtel anticipates obtaining water from either San Jose Municipal Water Division (MUNI) or Great Oaks Water Company (Great Oaks). The probable source of the potable water supply will be from ground water sources in the area. The potable water will be used to meet cooling water demands during periodic interruption in recycled water supply. Normal potable water demands will be met from these sources also (Calpine/Bechtel 2000e, p. 1). Since there appears to be some uncertainty concerning which water purveyor will ultimately provide services, there is a potential for change in the well and pipeline locations.

Staff has been provided with cultural resource and survey information for the MEC project and project linears. Staff has also reviewed the Draft EIR prepared by the City of San Jose for the anticipated area of the proposed CVRP. The proposed site is situated west of US 101 and Coyote Creek and immediately south of Tulare Hill. The site is bounded by Bailey Avenue on the south, the Santa Teresa Hills on the west and north, and the Union Pacific Railroad tracks on the east. The MEC Project

site is within the North Coyote Valley Campus Industrial Area which is larger than the CVRP area. (SJ 2000, p. 1; Basin Research, 1998, p. 1).

Staff has reviewed the cultural resources inventory prepared by Basin Research. Although cultural resource sites were identified by the North Coyote Valley Campus Industrial Area inventory, it does not appear that the MEC project, as currently defined, will impact any identified cultural resources. Impacts to areas not within the boundaries of these two study areas can not be identified by staff and appropriate mitigation can not be determined. In addition, there were sites identified that may be impacted by the North Coyote Valley Campus Industrial Area, but will not be impacted by the MEC project. Therefore, should the MEC project locate the potable water wells or related pipelines outside the boundaries of the proposed MEC project or the area 2, 500 feet south of Blanchard Road, bordered on the east by highway 101 and on the west by the Fisher Creek levee, additional cultural resources information will be required.

ACCESS ROADS

During the "Archaeological Presence Absence Testing Program", only culturally sterile soil was revealed in the area of the proposed access road. Therefore, no impacts to cultural resources are anticipated from this project feature.

No impacts to cultural resources are expected from the construction of this additional access road. However, since the road will be built in the area identified as Area 3 in the "Archaeological Presence Absence Testing Program," as a precautionary measure the applicant has recommended archaeological monitoring during project related earth disturbing activities.

CATEGORIZATION OF IDENTIFIED CULTURAL RESOURCES

Various laws apply to the treatment of cultural resources. These laws require the Energy Commission to categorize resources by determining whether they meet several sets of specified criteria. These categories then in turn influence the analysis of potential impacts to the resources and the mitigation that may be required to ameliorate any such impacts.

Under federal law, only historical or prehistoric sites, objects, or features, or architectural resources that are assessed by a qualified researcher as "important" or "significant" in accordance with federal guidelines need to be considered regarding potential impacts. The significance of historical and prehistoric cultural resources is judged in accordance with the criteria for eligibility for nomination to the National Register of Historic Places as defined in 36 CFR 60.4. If such resources are determined to be significant, and therefore eligible for listing in the National Register, as well as the California Register, they are afforded certain protection under the National Historic Preservation Act and/or CEQA. The Advisory Council on Historic Preservation, for example, must be given an opportunity to comment on any federally-funded or permitted undertaking that could adversely affect such resources.

The National Register criteria state that “eligible historic properties” are: districts, sites, building, structures, and objects that possess integrity of location, design, setting, materials, workmanship, feeling, and association, and that (a) are associated with events that have made a significant contribution to the broad patterns of our history; or (b) that are associated with the lives of persons significant in our past; or (c) that embody the distinctive characteristics of a type, period, or method of construction, or that represent the work of a master, or that possess high artistic values, or (d) that have yielded, or may be likely to yield, information important to history or prehistory. Isolated finds by definition do not meet these criteria. California has adopted a very similar set of criteria for assessing resources of statewide importance.

Under federal law, resources determined not to be significant, that is, not eligible for National Register listing, are subject to recording and documentation only, and are afforded no further protection. However, occasionally certain resources, although they may not be assessed as “significant,” may nonetheless be of local or regional importance such that mitigation may be warranted regardless of their assessed significance. Staff evaluates the survey reports and site records for any known resources located within or adjacent to the project APE to determine whether they meet the eligibility criteria.

The record and literature search and the walking surveys of the proposed project APE were conducted to identify the presence of any cultural resource sites or materials. Where resources were identified, additional evaluation would be conducted to determine whether the resources are already listed on, or are potentially eligible for listing on, either the National Register of Historic Places (National Register) [36 CFR 800] or the California Register of Historic Resources. The determination of eligibility is made in compliance with the applicable provisions of the National Historic Preservation Act.

Beginning in 1999, the California State Resources Agency adopted considerable revisions to the regulations implementing CEQA. These changes affected the language applicable to staff’s analysis of cultural resources. Previously, the bulk of the information on how to assess resource and impact significance and on the types of mitigation measures available was contained in Appendix K of the CEQA Guidelines. Much of the language of that appendix has now been incorporated into Title 14, California Code of Regulations, Sections 15126.4 and 15064.5.

The CEQA Guidelines now explicitly require the lead agency (in this case, the Energy Commission) to make a determination of whether a proposed project will affect “historic resources.” The guidelines provide a definition for historic resources and set forth a listing of criteria for making this determination. As used in CEQA, the term “historic resources” includes any resource, regardless of age, as long as it meets these criteria. If the criteria are met, the Energy Commission must evaluate whether the project will cause a “substantial adverse change in the significance of the historic resource,” which the regulation defines as a significant effect on the environment. The recent CEQA changes also indicate that the mitigation for impacts to historic resources that meet these criteria shall not be subject to the limitations provided in Public Resources Code, Section 21083.2.

Using the above criteria, staff has determined that the cultural resource sites described in the AFC and in subsequent filings for the MEC project meet one or more of the criteria for being an historical resource. As such, staff recommends full mitigation during project construction and operation activities, in order to protect these resources.

A section in CEQA addressing “unique” archeological resources provides a definition of such resources (Public Resources Code, Section 21083.2). This section establishes limitations on analysis and prohibits imposition of mitigation measures for impacts to archeological resources that are not unique. However, the CEQA Guidelines state that the prohibition in this section does not apply when an archeological resource has already met the definition of a historical resource (Title 14, California Code of Regulations, Section 15064.5). Since staff has determined that the sites for which it is recommending mitigation meet the definition of historical resources, the prohibition does not apply to the mitigation discussed in this staff assessment.

CUMULATIVE IMPACTS

The potential for cumulative impacts may be associated with the degree of prehistoric and historic sensitivity. The MEC site is proposed in an area sensitive for cultural resources. There are nine proposed projects within a five mile radius of the MEC project site. There are four projects within a three mile radius, two of which are located within one mile of the MEC. All of these proposed developments would cause considerable earth disturbance in Coyote Valley. In addition to the four projects planned within a three-mile radius of MEC, two of these proposed projects are within one mile of the MEC location. The closest proposed development to MEC is the Coyote Valley Research Park (Cisco), consisting of office, research, development, and light assembly facilities (CEC 1999k). In addition to Cisco, a residential development of 131 single-family units on an approximately 142 acre site is proposed. The Coyote Valley Urban Reserve (CVUR) may eventually include 20,000 to 25,000 housing units. These projects are most likely to contribute to cumulative impacts in conjunction with MEC because there is a possibility that they might impact some of the same sites. The earth disturbance caused by these projects will be considerable.

Proposed developments such as the MEC power plant and its associated linear facilities in conjunction with other development projects would increase the amount of land exposed to public access and potential removal or damage to cultural resources. The combined effects of such development can accelerate the potential for continued disturbance of cultural resource sites and the potential loss of valuable scientific information. The level of cumulative impact will grow as increasing development opens more undisturbed areas and eventually exposes highly sensitive cultural resource sites.

The incremental effect of this project would be likely to contribute to a significant cumulative impact on cultural resources in the Coyote Valley. The MEC and any development projects within the Coyote Valley vicinity are likely to impact previously

known cultural resources or encounter and disturb previously unknown cultural resources. Because these projects would disturb so much earth and because they would be built in such close proximity to one another, there is a possibility that more than one project could impact the same site. The process of determining the presence of significant cultural resources will continue into the construction phase of this project. The applicant can mitigate impacts to both undetermined and identified sites to less than significant by following the recommendations for monitoring and mitigation set forth in the proposed conditions of certification.

IMPACTS OF FACILITY CLOSURE

The anticipated lifetime of the Metcalf project is expected to be at least thirty years. It is anticipated that upgrades or modifications made prior to the facility's closure might extend the life of the plant. Closure would be caused by either (1) a natural or manmade disaster or economic difficulty, or (2) planned, orderly closure that will occur when the plant becomes economically non-competitive.

At the time of planned closure, all then-applicable LORS will be identified and the Energy Commission-required closure plan will address compliance with these LORS. Generally, if no additional ground disturbance occurs during closure activities and all conditions of certification have been met, no impacts to cultural resources would be expected. However, actual potential impacts are likely to depend upon the final location of project structures in relation to existing resources, and upon the procedures used for the removal of project structures. Since the spatial relationship between the closure and removal of project structures and sensitive resources cannot be determined at this time, no conclusion can be drawn at this time with respect to the impact of facility closure on cultural resources.

According to the AFC, a temporary closure where there is no release of hazardous materials would necessitate the implementation of 24-hour security. A contingency plan for temporary cessation of operation would be implemented that would ensure compliance with all applicable LORS.

If a site were abandoned, impact to cultural resources would be unlikely because there would be no immediate soil disturbances. Over time, depending on the need to disturb the ground to accomplish project closure and facility removal, some disturbance of known and/or previously unknown cultural resources might result.

COMPLIANCE WITH APPLICABLE LORS

Prior to initiating excavations under Highway 101, the applicant would need to obtain an encroachment permit from Caltrans. Construction of a storm water drainage pipe that would extend under an existing levee would trigger the necessity to obtain an Army Corps of Engineers Section 404 Permit, and compliance with Section 106 of the National Historic Preservation Act will become necessary.

MITIGATION

For cultural resources, the preferred method of mitigation is for project construction to avoid areas where cultural resources are known to exist, wherever possible. Often, however, avoidance cannot be achieved, and other measures such as surface collection, subsurface testing, and data recovery must be implemented. Mitigation measures are developed to reduce the potential for adverse project impacts on cultural resources to a less than significant level.

APPLICANT'S PROPOSED MITIGATION

As indicated in the AFC, the best mitigation measure is to avoid impact. Avoidance can be accomplished by the demarcation of boundaries of known cultural resources, and by fencing and directing construction equipment away from environmentally sensitive areas (Calpine/Bechtel 1999a, p. 8.3-24). Construction crews would be informed concerning the importance of cultural resources and the legal protections afforded them. Because this portion of Coyote Valley is particularly sensitive for cultural resources, the applicant recommends pre-construction and subsurface testing in several areas (Calpine/Bechtel 1999a, p. 8.3-25). Although the natural gas line was recommended for presence absence testing in the AFC, it was not included in the testing done in August 1999 (Calpine/Bechtel 1999k). Confidential Attachment CR-35 recommends monitoring for the southern portion of the project site. The AFC also states that monitoring may be recommended in other locations as needed.

The applicant also recommends Native American monitoring by a member of the Ohlone community if archaeological remains are discovered during project construction.

The applicant recommends the following six point program:

- Preconstruction assessment and construction training
- Construction monitoring
- Site recording and evaluation
- Mitigation planning
- Curation
- Report of findings (Calpine/Bechtel 1999a, pp. 8.3-26 to 8.3-29).

The applicant's consultant has also stated that emergency maintenance and repair could cause impacts to cultural resources.

The applicant's consultant has stated that in developing specific mitigation measures to address impacts for any site that cannot be avoided through redesign during construction, the potential for ongoing impacts to that resource must be considered. Any mitigative data recovery should be properly scoped, in conjunction with the appropriate agencies, to address potential long-term ongoing impacts (Calpine/Bechtel 1999a, pp. 8.3-28).

STAFF'S PROPOSED MITIGATION MEASURES

Commission staff concurs with the mitigation measures proposed by the applicant in the AFC and in supplemental filings. Staff has adapted the applicant's proposed mitigation measures into a series of conditions of certification, sometimes rewording for clarification and adding time frames and other requirements. Adoption of staff's proposed conditions of certification is expected to reduce the potential for adverse project impacts on cultural resources to a less than significant level.

The proposed mitigation measures would apply to any potential for impacts to sensitive cultural resources in all areas affected by the project. Mitigation measures are derived from good professional practice and they are based on the U.S. Secretary of the Interior's guidelines and incorporate the policies and guidelines of the County of Santa Clara and the City of San Jose. The mitigation measures set forth in the conditions have been applied to previous projects before the Commission and they have proven successful in protecting sensitive cultural resources from construction-related impacts while allowing the timely completion of many projects throughout California.

Staff proposes presence/absence testing along the proposed route for the natural gas line and in the area of the PG&E metering station to ensure that there are no unmitigated impacts to previously undiscovered resources in this archaeologically sensitive area. As reflected in the conditions of certification, staff also proposes monitoring during earth disturbance in the vicinity of the project site and laydown area. Moreover, monitoring should occur along the SBWR route, the lines and locations of both proposed wells, and the natural gas line route, including the PG&E metering station (if presence/absence testing reveals evidence of cultural resources). Human remains were present in several previously excavated sites within one mile of the project. In the cultural research inventory prepared for the CVRP, Basin Research expressed the opinion that there was a potential to unearth human burials at previously recorded site SCL-2 (Basin Research 1998, p. 7). Site SCL-2 is also within approximately 1 mile of project features. Due to the potential for encountering human remains in the project vicinity, staff proposes that a Native American monitor (Ohlone/Costanoan) be part of the cultural resources team and be present during cultural resources monitoring activities.

CONCLUSIONS AND RECOMMENDATION

CONCLUSIONS

There are a total of 44 recorded and recently identified cultural resource sites within one mile of the proposed MEC project. Six of these sites have been determined eligible to the NRHP and by inference to the CRHR. The presence of these previously identified cultural resources indicates that there is a strong possibility that project construction could encounter potentially significant cultural resources. If the following conditions of certification are properly implemented, the project will comply with applicable laws, ordinances, regulations, and standards, and no significant adverse direct, indirect, or cumulative impacts to cultural resources will occur.

RECOMMENDATION

Staff recommends that the Commission adopt the following proposed conditions of certification, which incorporate the mitigation measures discussed above.

PROPOSED CONDITIONS OF CERTIFICATION

CUL-1 Prior to the start of any construction-related vegetation clearance or earth disturbing activities, or project site preparation, the project owner shall provide the California Energy Commission (Commission) Compliance Project Manager (CPM) with the name and statement of qualifications of its designated cultural resource specialist who will be responsible for implementation of all cultural resources Conditions of Certification.

Protocol: The statement of qualifications for the designated cultural resource specialist shall include all information needed to demonstrate that the specialist meet the minimum qualifications set forth below, including the following:

- a) a graduate degree in anthropology, archaeology, California history, cultural resource management, or a comparable field;
- b) at least three years of archaeological resource mitigation and field experience in California; and
- c) at least one year's experience in each of the following areas:
 - 1. leading archaeological resource field surveys;
 - 2. leading site and artifact mapping, recording, and recovery operations;
 - 3. marshalling and use of equipment necessary for cultural resource recovery and testing;
 - 4. preparing recovered materials for analysis and identification;
 - 5. determining the need for appropriate sampling and/or testing in the field and in the lab;
 - 6. directing the analyses of mapped and recovered artifacts;
 - 7. completing the identification and inventory of recovered cultural resource materials; and
 - 8. preparing appropriate reports to be filed with the receiving curation repository, the State Historic Preservation Officer (SHPO), and the appropriate regional archaeological information center(s).

The statement of qualifications for the designated cultural resource specialist shall include:

- a) a list of specific projects the specialist has previously worked on;
- b) the role and responsibilities of the specialist for each project listed; and
- c) The names and phone numbers of contacts familiar with the specialist's work on these referenced projects.

Verification: At least ninety (90) days prior to the start of project earth disturbing activities, the project owner shall submit the name and statement of qualifications of its designated cultural resource specialist to the CPM for review and written approval.

At least ten (10) days, but no more than thirty (30) days prior to the start of any construction related vegetation clearance or earth disturbing activities or project site preparation, the project owner shall confirm in writing to the CPM that the approved designated cultural resource specialist will be available at the start date and is prepared to implement the cultural resource Conditions of Certification.

At least ten (10) days prior to the termination or release of a designated cultural resource specialist, the project owner shall obtain CPM approval of the replacement specialist by submitting to the CPM the name and a statement of qualifications of the proposed new designated cultural resource specialist.

Cul-2 Prior to the start of earth disturbing activities, the project owner shall provide the designated cultural resources specialist and the CPM with maps and drawings issued for the construction site plan and site layout and for the final alignment of any linear facilities. Maps provided will include the USGS 7.5 minute topographic quadrangle map and a map at an appropriate scale (i.e., 1:2000 or 1" = 200') for plotting individual artifacts. Maps shall show the following:

The location of all areas where surface disturbance may be associated with project related access roads, and any other project components.

Verification: At least seventy-five (75) days prior to the start of earth disturbing activities on the project, the project owner shall provide the designated cultural resources specialist and the CPM with final drawings and site layouts for all project facilities and for all areas potentially affected by project earth disturbing activities or project construction, on the USGS 7.5 minute topographic quadrangle map and on a map at a scale of 1:2000 or 1" = 200. If the designated cultural resources specialist requests enlargements or strip maps for linear facility routes, the project owner shall provide them. In addition, the project owner shall provide a set of these maps to the CPM at the same time that they are provided to the specialist.

CUL- 3 Prior to the start of project construction-related vegetation clearance or earth disturbing activities or project site preparation; the designated cultural resources specialist shall prepare, and the project owner shall submit to the CPM for review and written approval a Cultural Resources Monitoring and Mitigation Plan (CRMMP) identifying general and specific measures to minimize potential impacts to sensitive cultural resources. Approval of the CRMMP, by the CPM, shall occur prior to any construction-related vegetation clearance or earth disturbing activities or project site preparation.

Protocol: The Cultural Resources Monitoring and Mitigation Plan shall include, but not be limited to, the following elements and measures:

- a. A proposed research design that includes a discussion of questions that may be answered by the mapping, data and artifact recovery conducted during monitoring and mitigation activities, and by the post-construction analysis of recovered data and materials.
- b. Specification of the implementation sequence and the estimated time frames needed to accomplish all project-related tasks during the pre-construction, construction, and post-construction analysis phases of the project.
- c. Identification of the person(s) expected to perform each of the tasks; a description of each team member's qualifications and their responsibilities; and the reporting relationships between project construction management and the mitigation and monitoring team.
- d. A discussion of the inclusion of Native American observers or monitors, the procedures to be used to select them, and their role and responsibilities.
- e. A discussion of any measures such as flagging or fencing, to prohibit or otherwise restrict access to sensitive resource areas that are to be avoided during construction and/or operation, and identification of areas where these measures are to be implemented. The discussion shall address how these measures will be implemented prior to the start of construction and how long they will be needed to protect the resources from project-related effects.
- f. A discussion of the location(s) where monitoring of project construction activities is deemed necessary by the designated cultural resource specialist. The specialist will determine the size or extent of the areas where monitoring is to occur and will establish the percentage of the time that the monitor(s) will be present, however monitoring shall be conducted full time in the specified areas that follow. Monitoring shall be conducted full time on the project site and laydown area (excluding presence/absence testing Areas 1 and 2). It shall also be conducted full time on the South Bay Water Recycling (SBWR) route and the route to Well No. 23 (wherever earth-disturbing activity is taking place) and along the natural gas line (wherever monitoring is warranted by information acquired by presence/absence testing).
- g. A discussion of the requirement that all cultural resources encountered will be recorded and mapped (may include photos) and that all significant or diagnostic resources will be collected for analysis and eventual curation into a retrievable storage collection in a public repository or museum. The public repository or museum must meet the standards and requirements for the curation of cultural resources set forth at Title 36 of the Federal Code of Regulations, Part 79.
- h. A discussion of the availability and the designated specialist's access to equipment and supplies necessary for site mapping, photographing, and recovering any cultural resource materials encountered during construction.
- i. Identification of the public institution that has agreed to receive any data and cultural resources recovered during project-related monitoring and mitigation work. Discussion of any requirements, specifications, or funding needed for curation of the materials to be delivered for curation

and how they will be met. Also the name and phone number of the contact person at the institution shall be included.

Verification: At least sixty (60) days prior to the start of project construction related vegetation clearance or earth disturbing activities or project site preparation, the project owner shall provide the Cultural Resources Monitoring and Mitigation Plan, prepared by the designated cultural resource specialist, to the CPM for review and written approval.

CUL-4 Prior to the start of project construction-related vegetation clearance or earth disturbing activities or project site preparation, the designated cultural resource specialist shall prepare an employee training program. The project owner shall submit the cultural resources training program to the CPM for review and approval.

Protocol: The training program shall discuss the potential to encounter cultural resources in the field, the sensitivity and importance of these resources, and the legal obligations to preserve and protect such resources.

The training program shall also include the set of resource reporting procedures and work curtailment procedures that workers are to follow if previously unknown cultural resources are encountered during project activities. The training program shall be presented by the designated cultural resource specialist or qualified member of the cultural resources team(s) approved by the CPM and may be combined with other training programs prepared for biological resources, paleontologic resources, hazardous materials, or any other areas of interest or concern.

Verification: At least sixty (60) days prior to the start of project construction-related vegetation clearance or earth disturbing activities or project site preparation; the project owner shall submit to the CPM for review and written approval, the proposed employee training program, the set of reporting procedures, and the work curtailment procedures that the workers are to follow if previously unknown cultural resources are encountered during construction. The project owner shall provide the name and resume of the individual(s) performing the training.

CUL-5 Prior to the start of project construction-related vegetation clearance or earth disturbing activities or project site preparation; and throughout the project construction period as needed for all new employees, the project owner shall ensure that the designated cultural resource trainer(s) provide(s) the CPM-approved cultural resources training to all project managers, construction supervisors, and workers. The project owner shall ensure that the designated trainer provides the workers with the CPM-approved set of procedures for reporting any sensitive resources that may be discovered during project-related ground disturbance and the work curtailment procedures that the workers are to follow if previously unknown cultural resources are encountered during construction. The original cultural resource training session may be videotaped and shown to employees hired after the project is underway.

Verification: Within seven (7) days after the start of project related vegetation clearance or earth disturbing activities or project site preparation, the project owner shall provide the CPM with documentation that the designated cultural resources trainer(s) has/have provided to all project managers, construction supervisors, and workers hired before the start of construction the CPM-approved cultural resource training and the set of reporting and work curtailment procedures.

In each Monthly Compliance Report, after the start of construction, the project owner shall provide the CPM with documentation that the designated cultural resource trainer(s) has/have provided to all project managers, construction supervisors, and workers hired in the month, the CPM-approved cultural resources training and the set of resource reporting and work curtailment procedures.

CUL-6 The designated cultural resource specialist or the specialist's delegated monitor(s) shall have the authority to halt or redirect construction if previously unknown cultural resource sites or materials are encountered during project construction related vegetation clearance or earth disturbing activities or project site preparation.

If such resources are found, the halting or redirection of construction shall remain in effect until:

- the specialist has notified the CPM of the find and the work stoppage;
- the specialist, the project owner, and the CPM have conferred and determined what, if any, data recovery or other mitigation is needed; and
- any needed data recovery and mitigation has been completed.

The specialist, the project owner, and the CPM shall confer within five working days of the notification of the CPM to determine what, if any, data recovery or other mitigation is needed.

If data recovery or other mitigation measures are required, the specialist and team members shall monitor construction activities and implement data recovery and mitigation measures, as needed.

All required data recovery and mitigation shall be completed expeditiously unless all parties agree to additional time.

Verification: Thirty (30) days prior to the start of project construction-related vegetation clearance or earth disturbing activities and preparation; the project owner shall provide the CPM with a letter confirming that the designated cultural resources specialist and delegated monitor(s) have the authority to halt construction activities in the vicinity of a cultural resource find.

For any cultural resource encountered, the project owner shall notify the CPM within 24 hours.

CUL-7 Prior to the start of project construction related vegetation clearance or earth disturbing activities or project site preparation; and each week throughout project construction, the project owner shall provide the

designated cultural resource specialist with a current schedule of anticipated project activity in the following month and a map indicating the area(s) where the construction activities will occur. The designated cultural resource specialist shall consult daily with the project superintendent or construction field manager to confirm the area(s) to be worked on the next day(s).

Verification: Ten (10) days prior to the start of project construction- related vegetation clearance or earth disturbing activities or project site preparation; and in each Monthly Compliance Report thereafter, the project owner shall provide the CPM with a copy of each weekly schedule of the construction activities. The project owner shall notify the CPM when all ground disturbing activities, including landscaping, are completed.

CUL-8 Throughout the pre-construction reconnaissance surveys and the construction monitoring and mitigation phases of the project, the designated cultural resource specialist and delegated monitor(s) shall keep a daily log of any resource finds and the progress or status of the resource monitoring, mitigation, preparation, identification, and analytical work being conducted for the project. The daily logs shall indicate by tenths of a post mile, where and when monitoring has taken place, where monitoring has been deemed unnecessary, and where cultural resources were found.

The designated specialist shall prepare a weekly summary of the daily logs on the progress or status of cultural resource-related activities.

The designated resource specialist and delegated monitor(s) may informally discuss the cultural resource monitoring and mitigation activities with Commission technical staff.

Verification: Throughout the project construction period, the project owner shall ensure that the daily log(s) and the weekly summary reports prepared by the designated cultural resource specialist and delegated monitor(s) are available for periodic audit by the CPM. Copies of the weekly summary reports shall be submitted to the CPM in the Monthly Compliance Report.

CUL-9 Except in the areas specified in CUL-3(f), the designated cultural resource specialist or delegated monitor(s) shall be present at times the specialist deems appropriate to monitor construction-related ground disturbance, including grading, excavation, trenching, and/or auguring, in the vicinity of previously recorded archaeological sites and in areas where cultural resources have been identified.

Protocol: Except as specified in CUL-3(f), if the designated cultural resource specialist determines that full-time monitoring is not necessary in certain portions of the project area or along portions of the linear facility routes, the designated specialist shall notify the project owner and the CPM of the changes. The designated cultural resource specialist shall use milepost markers and boundary stakes placed by the project owner to identify areas where monitoring is being reduced or is no longer deemed necessary.

Verification: Throughout the project construction period the project owner shall include in the Monthly Compliance Reports to the CPM copies of the weekly summary reports prepared by the designated cultural resource specialist regarding project-related cultural resource monitoring.

CUL-10 The project owner shall obtain ground disturbance or cultural resource excavation permits from Caltrans and/or the U.S. Army Corps of Engineers, as necessary. If cultural resources are unearthed in an area covered by the Corps of Engineers permit, the project owner shall consult with that agency and the CPM regarding compliance with Section 106 of the National Historic Preservation Act.

Verification: The project owner shall submit a copy of any permit addressing data recovery excavation from Caltrans and/or the Corps of Engineers in the next monthly compliance report. After completion of the mitigation activity, the project owner shall also provide written documentation to the permitting agency and in the next Monthly Compliance Report following the completion of that activity, that the project owner has complied with any mitigation measures required as a result of permitted activity.

CUL-11 The project owner shall ensure that the designated cultural resource specialist performs the recovery, preparation for analysis, analysis, preparation for curation, and delivery for curation of all cultural resource materials encountered and collected during pre-construction surveys and during the monitoring, data recovery, mapping, and mitigation activities related to the project.

Verification: The project owner shall maintain in its compliance files, copies of signed contracts or agreements with the museum(s), university (ies), or other appropriate research specialists. The project owner shall maintain these files for the life of the project and the files shall be kept available for periodic audit by the CPM. Information as to the specific location of sensitive cultural resource site shall be kept confidential and accessible only to qualified cultural resource specialists.

CUL-12 Following completion of data recovery and site mitigation work, the project owner shall ensure that the designated cultural resources specialist prepares a proposed scope of work for the Cultural Resources Report. The project owner shall submit the proposed scope of work to the CPM for review and written approval.

Protocol: The proposed scope of work shall include (but not be limited to):

- a. a discussion of any analysis to be conducted on recovered cultural resource materials;
- b. discussion of possible results and findings;
- c. proposed research questions which may be answered or raised by analysis of the data recovered from the project; and
- d. an estimate of the time needed to complete the analysis of recovered cultural resource materials and to prepare the Cultural Resources Report.

Verification: The project owner shall ensure that the designated cultural resources specialist prepares the proposed scope of work within ninety (90) days following completion of the data recovery and site mitigation work. Within seven (7) days after completion of the proposed scope of work, the project owner shall submit it to the CPM for review and written approval.

CUL-13 The project owner shall ensure that the designated cultural resources specialist prepares a Cultural Resources Report. The project owner shall submit the report to the CPM for review and written approval.

Protocol: The Cultural Resources Report shall include, (but not be limited to) the following:

a. For all projects:

1. description of pre-project literature search, surveys, and any testing activities;
2. maps showing areas surveyed or tested;
3. a description of any monitoring activities;
4. maps, including maps using a 7.5 minute USGS topographic base, of any areas monitored; and
5. conclusions and recommendations.

b. For projects in which cultural resources were encountered, include the items specified under “a” and also provide:

6. site and isolate records and maps;
7. a description of testing for, and determinations of, significance and potential eligibility; and
8. a discussion of the research questions answered or raised by the data from the project.

c. For projects regarding which cultural resources were recovered, include the items specified under “a” and “b” and also provide:

9. a description of the methods employed in the field and laboratory; a description (including drawings and/or photos) of recovered cultural materials;
10. results and findings of any special analyses conducted on recovered cultural resource materials;
11. an inventory list of recovered cultural resource materials; an interpretation of the site(s) with regard to the research design; and
12. the name and location of the public repository receiving the recovered cultural resources for curation.

Verification: The project owner shall ensure that the designated cultural resource specialist completes the Cultural Resources Report within ninety (90) days following completion of the analysis of the recovered cultural materials. Within seven (7) days after completion of the report, the project owner shall submit the Cultural Resources Report to the CPM for review and written approval.

CUL-14 The project owner shall submit an original, an original-quality copy, and a computer disc copy (or other format to meet the repository’s requirements),

of the CPM-approved Cultural Resource Report to the public repository to receive the recovered data and materials for curation, with copies to the State Historic Preservation Officer (SHPO), the appropriate regional archaeological information center(s), and a person employed by the City of San Jose who is authorized to receive confidential cultural resources information. If the report is submitted to any of these entities on a computer disc, the disc files must meet SHPO requirements for format and content.

Protocol: The copies of the Cultural Resource Report to be sent to the entities specified above shall include the following based on the applicable scenario (a, b, or c) set forth in condition Cul-13:

- a. originals or original-quality copies of all text;
- b. originals of any topographic maps showing site and resource locations;
- c. originals or original-quality copies of drawings of significant or diagnostic cultural resource materials found during pre-construction surveys or during project monitoring and mitigation and subjected to post-recovery analysis and evaluation; and
- d. photographs of any cultural resource site(s) and the various cultural resource materials recovered during project monitoring and mitigation and subjected to post-recovery analysis and evaluation. The project owner shall provide the curation repository with a set of negatives for all of the photographs.

Verification: Within thirty (30) days after receiving approval of the Cultural Resources Report, the project owner shall provide to the CPM documentation that the report has been sent to the public repository receiving the recovered data and materials for curation, the SHPO and the appropriate archaeological information center(s), and the City of San Jose, to a person authorized to receive confidential cultural resources information.

For the life of the project, the project owner shall maintain in its compliance files copies of all documentation related to the filing of the CPM-approved Cultural Resources Report with the public repository receiving the recovered data and materials for curation.

CUL-15 Following the filing of the CPM-approved Cultural Resource Report with the appropriate entities, specified in condition CUL-14, the project owner shall ensure that all cultural resource materials, maps, and data collected during data recovery and mitigation for the project are delivered to a public repository that meets the US Secretary of Interior requirements for the curation of cultural resources. The project owner shall pay any fees for curation required by the repository.

Verification: The project owner shall ensure that all recovered cultural resource materials are delivered for curation within thirty (30) days after providing the CPM-approved Cultural Resource Report to the entities specified in CUL-14.

For the life of the project the project, owner shall maintain in its of compliance files, copies of signed contracts or agreements with the public repository to which the project owner has delivered for curation all cultural resource materials collected during data recovery and mitigation for the project.

CUL-16 Prior to the start of any construction-related vegetation clearance or earth disturbing activities, project site preparation or presence absence testing required in these conditions, the project owner and the designated cultural resources specialist shall consult with Ohlone/Costanoan Native American tribal representatives to develop an agreement(s) for qualified (as specified in the NAHC Guidelines for Monitoring) monitor(s). The monitor(s) shall be considered a member(s) of the cultural resource team and shall be present during the pre-construction and construction phases of the project whenever cultural resources monitoring activities are conducted.

Verification: At least thirty (30) days prior to the start of project-related vegetation clearance or earth disturbing activities or project site preparation, the project owner shall provide the CPM with a copy of all finalized agreements for Native American (Ohlone/Costanoan) monitor(s). If efforts to obtain the services of qualified Native American monitor(s) prove unsuccessful, the project owner shall immediately inform the CPM who will initiate a resolution process.

CUL-17 Prior to any project related ground disturbance, including grading, trenching, boring, digging pits or horizontal directional drilling in the vicinity of the natural gas pipeline route or PG& E metering station, presence/absence testing shall be conducted.

Verification: Reports addressing the results of the presence/absence testing shall be included in the Monthly Compliance Report.

CUL-18 Prior to initial project site mobilization (i.e., placing a trailer on the site with accompanying equipment, utilities and grading) the project owner must comply with Cul-1 and Cul-4 and complete Cul-5 as it pertains to management, supervisors and workers involved in this undertaking. The project owner shall comply with Cul-2 and Cul-3 for the entire project, but this need not be accomplished before the trailer is placed. If cultural resources are discovered, all cultural conditions shall apply.

Prior to the initial site mobilization, the designated cultural resource specialist shall examine the area of initial project site mobilization and ensure that there are no cultural resources that may require protection or mitigation.

Verification: At least (7) days prior to engaging in the initial project site mobilization defined in this condition, the project owner shall provide the CPM with information authored by the designated cultural resource specialist identifying the area of initial site mobilization. The cultural resource specialist shall indicate the method(s), procedure(s) and date(s) the cultural resource inspection was performed and an explanation of the anticipated project activities. The document will be reviewed and approved by the CPM.

CUL-19 If the potable water wells and associated pipelines are to be located anywhere but in an area defined as part of the proposed project or in an area

defined as bordered by Fisher Creek levee on the west, by Highway 101 on the east and a southern limit at 2,500 feet south of Blanchard Road, then a cultural resource assessment shall be required. The cultural resource assessment shall consist of a records search and a pedestrian survey which gives equal emphasis to prehistoric and historic resources and an evaluation of significance. A Native American monitor from a group with historic ties to the affected area shall be retained as part of the cultural resources team during any surveys or subsurface investigation.

Verification: Ninety (90) days prior to the start of any construction-related vegetation clearance or earth disturbing activities or project site preparation at the newly identified location of the potable water well(s) or line(s), the project owner shall submit the following for approval by the CPM: (1) the results of the records search and the results of the survey. The information shall also include the name and tribal affiliation of the Native American monitor. An evaluation, including site records, of all cultural resources within or adjacent to the project Area of Potential Effects (APE) shall also be submitted.

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SOCIOECONOMICS

Testimony of James Adams

INTRODUCTION

A staff socioeconomic impact analysis evaluates the project induced changes on community services and infrastructure including schools, medical and protective services and related community issues such as environmental justice and facility closure. This analysis discusses the potential direct and cumulative impacts of the proposed Metcalf Energy Center (MEC) project on local communities, community resources, and public services.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

FEDERAL

Executive Order 12898, "Federal Actions to address Environmental Justice (EJ) in Minority Populations and Low-Income Populations," focuses federal attention on the environment and human health conditions of minority communities and calls on agencies to achieve environmental justice as part of this mission. The order requires the US Environmental Protection Agency (EPA) and all other federal agencies (as well as state agencies receiving federal funds) to develop strategies to address this issue. The agencies are required to identify and address any disproportionately high and adverse human health or environmental effects of their programs, policies, and activities on minority and/or low-income populations.

STATE

CALIFORNIA GOVERNMENT CODE, SECTIONS 65996-65997

As amended by SB 50 (Stats. 1998, ch. 407, sec. 23), these sections state that public agencies may not impose fees, charges, or other financial requirements to offset the cost for school facilities.

14 CALIFORNIA CODE OF REGULATIONS, SECTION 15131

- (b) Economic or social factors of a project may be used to determine the significance of physical changes caused by the project.
- (c) Economic, social and particularly housing factors shall be considered by public agencies together with technological and environmental factors in deciding whether changes in a project are feasible to reduce and or avoid the significant effects on the environment.

LOCAL

SANTA CLARA COUNTY GENERAL PLAN

The General Plan encourages increased economic development planning and promotion consistent with the economic well-being of Santa Clara County. Relevant policies include:

C-EC-9

“Coordinated countywide economic development planning and promotion efforts should be increased.”

C-EC-10

“The County shall play a leadership role in encouraging and facilitating coordinated countywide economic development planning.”

CITY OF SAN JOSE 2020 GENERAL PLAN

The basic economic goal is to create a stronger municipal tax base by obtaining a greater share of the total industrial and commercial development in the County, and by nurturing and encouraging expansion of the existing industrial and commercial development in the City of San Jose. The Economic Development Major Strategy is designed to maximize the economic potential of the City’s land resources while providing for employment opportunities for San Jose residents.

Economic Goal #7 states that the City encourages a mix of land uses contribute to a balanced economic base, including industrial suppliers and services, “green industries,” as well as high technology manufacturers and other related industries.

NORTH COYOTE VALLEY CAMPUS INDUSTRIAL AREA PLAN

This Plan expresses the need for development to bear the costs of any necessary extensions or expansions of public infrastructure. It serves as a guideline for all public agencies and future developers who will participate in the building of the North Coyote Campus Industrial community.

SETTING

PROJECT LOCATION

The proposed MEC would be located at the southern base of Tulare Hill at the northern end of Coyote Valley in south San Jose just west of Monterey Highway and south of the Metcalf road intersection. For a full description of the location, please refer to the **Project Description** section of this document and the project description and location in the Metcalf Application for Certification (AFC), Vol. 1 (Calpine/Bechtel, 1999a). The study area (affected area), as defined in the socioeconomics section of the AFC, includes the San Jose Metropolitan Statistical Area (MSA) and the City of San Jose. There are a variety of communities within this area such as Campbell, Cupertino, Gilroy, Los Altos, Milpitas, Morgan Hill, Mountain

View, Palo Alto, Santa Clara, Saratoga, and Sunnyvale. The population of Santa Clara County in 1997 was estimated to be 1.6 million, which is a 9 percent increase from 1990 (U.S. Census Bureau 1999). Staff expects that the City of San Jose and Santa Clara County will receive the majority of the socioeconomic impacts generated by the project.

DEMOGRAPHICS

The 1990 U.S. Census estimated the population of Santa Clara County at approximately 1.5 million. Of this amount, 58 percent were white and 42 percent were minority (Black, American Indian, Eskimo, Aleut, Asian or Pacific Islander, Hispanic, or other). For the south San Jose area within six miles of the proposed MEC, the 1990 U.S. Census shows that minorities comprised about 38 percent of the population (See **Socioeconomics Table 1**). This percentage is estimated to have increased to 49 percent in 1999 according to projections based on the 1990 Census data by the marketing firm of Claritas (Claritas 2000). Because the Claritas data is an estimate based on the 1990 Census, staff considers the 1990 data most reliable. **Figures 1 and 2** display the percentage of people of color using the 1990 Census data and 1999 data provided by Claritas, a private marketing firm.

The demographic profile displayed in **Socioeconomics Table 2** shows the white and minority populations in census tracts within a six-mile radius of the proposed MEC site using the 1999 population estimate from Claritas. There are nine census tracts within the six-mile radius that have a minority population of more than 50 percent.

Socioeconomics Table 3 indicates that approximately five percent of the people living within six miles of the MEC are low-income.

SOCIOECONOMICS Table 1
Demographic Profile For Census Tracts Within Six Miles of the MEC Site
1990 Census Data

Census Tract	White	Minority *	Total Population In Census Tract	Percent Minority In Census Tract
512798	690	221	911	24
512100	921	982	1903	52
512298	2503	598	3101	19
511911	2326	756	3082	25
512012	5229	2294	7523	30
512032	2230	1439	3669	39
512033	4032	1576	5608	28
512031	3502	1158	4660	25
512030	2472	818	3290	25
512028	3540	1679	5219	32
512014	4394	1666	6060	27
511909	4207	1737	5944	29
511912	3714	1344	5058	26
512029	5014	1921	6935	28
512023	2840	2504	5344	47
512022	2600	1005	3605	28
512018	2704	4155	6859	61
512017	2850	3642	6492	56
512021	3695	2206	5901	37
503208	1060	2777	3837	72
512097	1629	1788	3417	52
503318	3401	4172	7573	55
503320	4744	1272	6016	21
503319	1365	2293	5647	41
512098	3354	2293	5647	41
Totals	75,016	45,451	120,467	38
* Hispanic Origin, Black, American Indian, Asian Pacific Islander, Other Source: 1990 US Census Data, Statistical Information on Population				

SOCIOECONOMICS Table 2
Demographic Profile For Census Tracts Within Six Miles of the MEC Site
1999 Population Estimates

Census Tract	White	Minority *	Total Population In Census Tract	Percent Minority In Census Tract
512798	631	276	907	30
512100	730	1312	2042	64
512298	2310	938	3284	29
511911	2724	1128	3852	29
512012	4995	3169	8164	39
512032	1848	2118	3966	53
512033	4070	2068	6138	34
512031	3469	1542	5011	31
512030	2541	1045	3595	29
512028	3312	2322	5634	41
512014	4095	2415	6510	37
511909	4346	2513	6859	37
511912	3707	1674	5381	31
512029	4886	2625	7511	35
512023	2038	3638	5676	64
512022	2706	1473	4179	35
512018	1635	5930	7565	78
512017	2367	4951	7318	68
512021	3368	2892	6260	46
503208	594	3596	4190	86
512097	1924	3048	4972	61
503318	3677	6776	10453	65
503320	5136	1861	6997	27
503319	1941	3448	5389	64
512098	3163	3036	6199	49
Totals	74,612	68,502	140,715	49
* Hispanic Origin, Black, American Indian, Asian Pacific Islander, Other Source: Claritas. Race and Hispanic Origin Population Estimates for 1999				

SOCIOECONOMICS Table 3
Number of Persons Living Below Poverty Level Within Six Miles of the MEC Site

Census Tract	Number of Persons in Tract	Persons Below Poverty Level	Percent Below Poverty Level
512798	911	101	11
5121	1903	160	8
512298	3101	122	4
511911	3082	132	4
512012	7523	346	5
512032	3669	155	4
512033	5688	293	5
512031	4660	83	2
512030	3290	90	3
512028	5219	403	8
512014	5820	185	3
511909	5944	90	1
511912	5058	136	3
512029	6935	124	2
512023	5399	522	10
512022	3605	124	3
512018	6859	1021	15
512017	6492	582	9
512021	5901	129	2
503028	3837	230	6
512097	3417	186	5
503318	7573	364	5
50032	6016	81	1
Totals	111602	5659	5
Source: 1990 US Census Data, Statistical Information on Population			

EMPLOYMENT

Employment in Santa Clara County in 1999 was estimated at 933,500 with approximately 3 percent of the available workforce unemployed. The largest sectors of employment were manufacturing, trade, services, state and local government, and construction respectively (CDF, 1999). An April 14, 2000 press release by the California Employment Development Department (EDD) noted that employment in Santa Clara County increased 2.1 percent from March 1999 to March 2000. The largest gains were in business services and amusements.

FINANCIAL

The San Jose/Santa Clara County area ranks as one of the strongest economies in the country with a reputation as a world class manufacturing community with a highly productive labor force. Santa Clara County ranks first among all nine Bay Area counties in new construction (\$3.2 billion in 1998), total retail sales (\$19.2 billion in 1998), total net effective buying income (\$39.6 billion in 1998), and total manufacturing employment (246,003 in 1997). San Jose ranks third in the nation in median household effective buying income of \$54,144 in 1998. Silicon Valley is considered the single most important high-tech center in the U.S. (San Jose Chamber of Commerce 1999).

HOUSING

As of January 1, 1999, there were a total of 581,532 housing units in Santa Clara County, with about 4 percent vacant (CDF 1999). Housing construction is lagging behind job growth, which forces workers to live quite far from the San Jose area and commute long distances to work (ABAG 1999). It is estimated that by 2020, the San Jose Metropolitan Statistical Area will produce 50 percent more jobs while housing will increase by only 20 percent (ABAG 2000).

SCHOOLS

The MEC site is located in the Morgan Hill Unified School District and is adjacent to the Oak Grove School District/ East Side Union High School District. Staff has determined that the Morgan Hill Unified School District currently exceeds the District's planned capacity. There are plans to construct an elementary and high school to accommodate additional students. Construction should begin in 2001 (Pasillas 2000).

UTILITIES, EMERGENCY AND OTHER SERVICES

San Jose receives gas and electricity from Pacific Gas & Electric. Water is supplied by the South Bay Water Recycling Program and the San Jose Municipal Water System. Sewer services for the proposed MEC site is provided by the City of San Jose (Rosenbloom 1999). Fire protection services are provided by the San Jose Fire Department and the South Santa Clara County Fire District (Buzzetta 1999). The primary responder for emergency calls is the Santa Clara County Sheriff's Department, though the San Jose Police Department is available for backup or initial response as needed (Hirokawa 1999).

The nearest hospital to the MEC site is the Santa Teresa Kaiser Permanente Medical Center located less than four miles to the northwest. It is a 336-bed hospital that can provide a wide variety of services to area members. There are over a dozen other hospitals in Santa Clara County including four facilities in San Jose. All hospitals coordinate response to large-scale emergencies and ambulance services are available from every hospital. With the exception of the flu season, bed and service capacity is available throughout the year (Kelsey 2000).

IMPACTS

PROJECT-SPECIFIC IMPACTS

Staff reviewed the MEC AFC, Vol. I, July 1999, Socioeconomic Section 8.8, and subsequent revisions regarding potential impacts to community services and infrastructure (i.e., employment, housing, schools, utilities, emergency and other services), and environmental justice. In addition, staff reviewed the relevant supplemental filings outlined in Calpine/Bechtel Status Report #5 dated February 16, 2000. The applicant used appropriate public databases (e.g. EDD, U.S. Census Bureau) in the analysis in the AFC. Staff's analysis is based on verification of the information within the AFC and independent research as discussed below. Staff finds the AFC's socioeconomic analysis and conclusions to be acceptable.

EMPLOYMENT

Calpine/ Bechtel anticipate that the workforce in the San Francisco Bay area will adequately fulfill the labor requirements for MEC. Construction of the facility will take 18 to 20 months and the personnel required will peak at 399 workers during month 16 of the construction period. There will be a gradual increase in workers from the first months of construction and a gradual decrease in the last months of construction. There will be over 100 workers on site during approximately 11 months of the construction period. Approximately 20 personnel will be employed throughout the facility's operation. Tables 8.8-5 through 8.8-11 in the socioeconomic section of the AFC display information on employment distribution, the types of personnel for construction by month, available labor by skill in Santa Clara County, and plant operations work force. These numbers are consistent with other power plant projects.

The EDD and local labor officials agree that the number of skilled and manual laborers in the San Francisco Bay area is adequate to meet the construction needs of this project (EDD 1999). Consequently, staff estimates that almost all of the construction labor force will commute daily to the job site from their homes in area communities. During the operational life of MEC, staff anticipates that the employees will commute from within Santa Clara or adjacent counties. In general, full-time jobs have a multiplier effect on the local and regional economy by supporting additional indirect job growth. It is estimated that two-to-three indirect jobs are supported by each construction job, such as those that would be generated at the MEC.

HOUSING

The demand for housing in the project area is not expected to increase appreciably as a result of the MEC because the vast majority of the work force are expected to commute from the San Francisco Bay area and adjacent counties. Those workers who live a long distance (more than a two-hour drive) could temporarily relocate in the San Jose area. Temporary housing opportunities such as motels and short-term rentals of housing are available. There are approximately 113 hotels and motels with about 10,000 rooms available in the greater San Jose area with a vacancy rate of approximately 17 percent (Bradley 2000). There are also recreational vehicle parks and KOA Campground facilities in Santa Clara and adjacent counties (Millard 2000). For example, the Maple Leaf RV Park in Morgan Hill has 270 full hook-up spaces (Yoders 2000).

SCHOOLS

Industrial development within the Morgan Hill Unified School District is currently charged a one-time assessment fee of \$0.31 per square foot of principal building area. At this rate, the fee for MEC will be about \$8,587. Because almost all of the construction workforce is expected to commute from homes in the area where their children are already attending schools, no significant impacts is expected on the Morgan Hill or Oak Grove School Districts. Operation employees are expected to be drawn from the local workforce in Santa Clara County and therefore, no significant impact is expected on Morgan Hill or Oak Grove school districts.

UTILITIES, EMERGENCY AND OTHER SERVICES

The South Bay Water Recycling Program (SBWR) will be the primary source of cooling water for the MEC. It is estimated that the MEC would require approximately 5 million gallons of water per day at peak flow. Potable water will be required for non-cooling industrial processes and domestic uses. Calpine/Bechtel are also proposing to use potable water resources for back-up supplies in the event that recycled water is not available. Two water purveyors are being considered to supply water resources to the MEC: San Jose MUNI and Great Oaks Water Company. Both of these retailers have indicated that additional infrastructure (wells and pipelines) will be needed to serve the MEC. The applicant will hook up to the San Jose sewer system to dispose of all wastewater. For more discussion on water resources issues, please see **Water Resources**.

PG&E will provide electricity during construction from the Metcalf substation which is near the plant site, and natural gas will be acquired from a major PG&E gas line within 200 feet east of Highway 101.

The City of San Jose's General Plan states that "New development is expected to pay for the infrastructure required to support it" (San Jose 2020 General Plan 1994). This is also consistent with the North Coyote Valley Campus Industrial Area Plan that requires developers to bear the cost of any extensions or expansions of public infrastructure. Staff understands that the City of San Jose and the applicant are negotiating the fair share amount that the applicant will pay for the waterlines needed for the project. The MEC is consistent with the City of San Jose's 2020 General Plan which encourages the expansion of the existing industrial and

commercial sector of the local economy. In particular, the MEC is consistent with Economic Goal #7 of the General Plan that encourages a mix of land uses that contribute to a balanced economic base, including industrial suppliers and services. However, the project is incompatible with the current Campus Industrial Zone designation.

Based on a personal communication with a member of the San Jose Fire Department, staff has identified that current resources are inadequate to handle potential impacts or emergencies from the MEC (Buzzetta 1999). Specifically, the response time to an emergency call is already longer than fire regulations require. The hazardous materials team is located in the northern part of San Jose and could be delayed by traffic if called on to respond to an emergency at the MEC. In addition, projected economic development, including the MEC, requires a new fire station in the Northern Coyote Valley.

These concerns were noted in a letter from the San Jose Planning Department that outlined the need for a new fire station and staffing for a minimum of one engine and truck company (Derryberry 1999). Given expected additional development throughout the San Jose area, the Planning Department and the San Jose Fire Department are developing a strategy to meet fire protection needs for the foreseeable future (Prevetti 2000). A condition of certification to assure that Calpine/Bechtel and the San Jose Fire Department reach an agreement on funding the new fire station, related equipment, and staffing is contained in **Worker Safety and Fire Protection**.

Based on personal communication with representatives of the Sheriff's Department and the San Jose Medical Center, staff believes that the MEC will not adversely affect police or hospital services (Hirokawa 1999, Kelsey 2000).

FINANCIAL

The applicant estimates that the construction payroll will be \$40.8 million (1999 dollars) for 18-20 months, and the operation payroll will be \$1 million annually, the bulk of which will be spent in the affected area communities (AFC p.8.8-9). The applicant estimates that \$5 to \$10 million worth of materials and equipment will be purchased locally during construction. This spending will generate 8.25 percent sales tax revenues for Santa Clara County. This is divided up as follows: 6 percent goes to the state, 1 percent goes to the place of sale, 0.25 percent goes to the county transportation authority, 0.5 percent goes to the county transit district, 0.5 percent goes to the county general fund (AFC p. 8.8-15). The annual operations budget will be \$2 to \$4 million and there will be an annual maintenance budget of \$10 to \$15 million. If the facility is assessed at between \$300 and \$400 million, the total property tax obligation will range from \$3 to \$5.2 million annually that will go to San Jose and Santa Clara County (See **Socioeconomics Table 3**). The MEC will have a relatively small but positive financial impact on the San Jose area.

ENVIRONMENTAL JUSTICE

For all siting cases staff follows the U.S. Environmental Protection Agency's guidance in conducting a two-step environmental justice analysis. The analysis

assesses whether the potentially affected community has a population that is more than 50 percent minority and/or low-income, or has a minority or low-income population percentage that is meaningfully greater than the percent of minority or low-income in the general population or other appropriate unit of geographic analysis. The analysis also assesses whether the environmental impacts are likely to fall disproportionately on the minority and/or low-income population.

If the analysis indicates the presence of a substantial minority or low-income population, staff contacts local community groups to provide the Commission with a fuller understanding of the community and the potential environmental justice issues. In addition, community groups are asked to help identify potential mitigation measures.

Staff has determined the affected area for this environmental justice analysis to be the area within a six-mile radius of the proposed project site. The affected area is defined as the area potentially impacted by the proposed project (primarily for air quality and public health). As noted above in the Demographics discussion, **Socioeconomics Table 1** shows census tracts within the six-mile radius that had a minority population of more than 50 percent as estimated by the 1990 Census data. **Socioeconomics Table 2** depicts the same census tracts using the 1999 Claritas data.

Staff contacted members of the Hispanic, Asian and African-American communities to inform them about the MEC and the Commission siting process. A community meeting was held on March 14, 2000. Staff and the Commission's Public Adviser provided materials in English and Spanish, discussed the project and the power plant siting process, and answered questions. One of the community members served as a Spanish interpreter.

Because the federal guidance does not give a percentage of population threshold to determine when a low-income population becomes recognized for an environmental justice analysis, staff use the same greater than 50 percent threshold that is used for minority populations. The low-income population, at five percent in the MEC area, is significantly below this threshold; therefore there is no low-income environmental justice issue. **Socioeconomics Table 3** depicts the number of persons living below poverty level within six miles of the proposed MEC site.

As noted under Setting above, the census tracts adjacent to or near the MEC that have a minority population greater than 50 percent are sparsely populated agricultural areas. Staff has determined that, in terms of air quality and public health impacts, the MEC will not have a significant adverse impact. In addition, staff has not identified any cumulative significant adverse impact resulting from the MEC and other existing and proposed projects in the vicinity of the MEC. For further information see the **Air Quality** and **Public Health** sections of the FSA. Staff has not identified any unique circumstances in the minority community that result in a significant impact, therefore, there will be no disproportionately high and adverse effect on the minority populations in the census tracts identified as having greater than 50 percent minority.

PROPERTY VALUES

In general, the project area is experiencing significant growth which is amplifying a housing shortage and causing the average price of a home to increase. A number of residents in the Tulare Hill area have expressed concerns about the project's impact on property values. The concern is that those individuals who decide to sell their homes or businesses will not be able to get full market value once the power plant is built and operating. Because staff has encountered this view in previous siting cases (Crockett, San Francisco, Sutter), staff requested the applicant perform a property values analysis that included: 1) a study of possible effects on property values in neighborhoods in proximity to the proposed MEC (Supplement SO-7A), 2) a review of the literature on property value impacts from industrial activities (Supplement SO-7B), and 3) an analysis of housing price and sales trends for neighborhoods in proximity to the proposed MEC (Supplement SO-7C).

A consultant was hired by staff to review the applicant's supplemental analyses, conduct a review of the literature on property value impacts from industrial activities, and summarize the findings (Troy 1999). In general, there is no information or study that demonstrates an adverse or negative impact on property values directly attributable to a natural gas-fired power plant. Further, the housing market is extremely tight in the San Jose /Santa Clara area because of an imbalance between housing supply and demand. This has led to an increase in the median home price of over 20 percent from 1998 to 1999 in this area (ABAG 1999). Property values in this area are expected to continue to increase in the foreseeable future.

CUMULATIVE IMPACT

Staff has identified a variety of projects that are undergoing or will undergo CEQA review of their applications. These include the Coyote Valley Research Park (CiscoS), a 688 acre project that will include office, research and development, and light assembly buildings that will employ approximately 20,000 employees upon full buildout. The site is about one-quarter mile south of the MEC site. Construction is expected to start in the summer of 2000. A residential development, expected to be located approximately one mile northeast of MEC, would involve building 131 single-family homes on 28 acres. The EIR for the project has not been completed.

There are several other projects planned for areas within three-to-four miles of MEC. The Coyote Valley Urban Reserve is located two miles south and would contain as many as 25,000 homes, but the development is considered long-term in nature. The Hellyer View I project involves a 400,000 sq. ft. manufacturing, research, development, and warehousing facility about four miles north of MEC. A decision on a site development plan is pending. Another manufacturing, research and development facility called Creekside Plaza is planned for an area four miles north of the MEC. This project is also waiting to receive a site development permit.

Construction of some of these projects will likely overlap with construction of the MEC should it be approved. In addition, there may be an overlap with Calpine's other power plant projects in the Pittsburg and Antioch area. The only potential impact from a cumulative socioeconomic point of view would be a possible shortage

of workers in some trades. However, because of the large available work force in the San Jose/San Francisco Bay area and adjacent counties, staff believes that there are an adequate number of workers in the area. The 20 operation workers needed for the MEC will have an insignificant contribution to a cumulative socioeconomic impact when compared to the projected 20,000 employees for the CVRP at full buildout.

Workers commuting from other communities in Santa Clara and neighboring counties to south San Jose will minimize the impacts on housing and local services. Housing, medical services and schools will not be adversely impacted. Assuming the deliberations between the applicant, the City Planning Department, and the fire district are resolved satisfactorily to all parties, fire protection services to the south San Jose area in general will not be adversely affected by the addition of the MEC and other development. Property tax revenues from the all these projects will benefit school, fire and other districts in the San Jose area as depicted in **Socioeconomics Table 4.**

In summary, staff believes that the construction and operation of the MEC, along with the development of other projects in the vicinity will not add significantly to the cumulative socioeconomic impacts on the local area. However, the full buildout of the Cisco project will have a significant socioeconomic affect on the south San Jose area.

MITIGATION

Energy Commission staff has identified economic and fiscal benefits to the project area such as employment, project expenditures, sales, and property tax revenues. To ensure that the local area benefits from the project, staff is proposing a condition of certification that will lead to local employment and project-related expenditures. A condition is proposed to ensure that the project owner pays the Morgan Hill Unified School District a one-time assessment fee of \$8,587.

Socioeconomics Table 4
Estimated Property Tax Distribution for Metcalf Energy Center

Taxing Jurisdictions	Approximate Post ERAF Share of Tax Increment	Estimated Revenue at \$3 Million/Year in Property Taxes	Estimated Revenue at \$5 Million/Year in Property Taxes
County General	13.2%		\$664,781
County Library	2.46%	\$398,868	\$123,495
Morgan Hill Unified School District	46.29%	\$74,097	\$2,314,722
Gavilan Community College	5.88%	\$1,388,833	\$294,230
County School Service	0.48%	\$176,538	\$24,440
County Office of Education	3.05%	\$14,664	\$152,926
South Santa Clara County Fire	10.07%	\$91,756	\$556,400
Santa Clara Valley Water District East 1	1.6%	\$321,000	\$80,328
Santa Clara Valley Water District	0.15%	\$48,197	\$7,791
Bay Area Air Quality Management District	0.17%	\$4,675	\$8,769
Guadalupe-Coyote Resource Conservation District	0.04%	\$5,261	\$2,080
Santa Clara Valley Water District Zone W-3	0.09%	\$1,200	\$47,442
SCVWD State Water Project	0.46%	\$28,485	\$23,180
Educational Revenue Augmentation Fund	13.88%	\$13,908	\$694,138
		\$416,483	
TOTALS	100.00%	\$3,043,965	\$4,994,722
Source: Adapted From Data from Wendy Beetle, Tax Assessor, Santa Clara County			

FACILITY CLOSURE

Should the plant be permanently closed, the beneficial socioeconomic impacts such as worker payroll, project expenditures, local economic stimulus, and property tax revenues would no longer occur. The MEC AFC (pp. 4-1 and 4-2) describes what will happen if the plant is shutdown or closed prematurely. The planned lifetime of the proposed power plant is 30 years; however, given unforeseen circumstances the plant may be retired prematurely for a variety of reasons. This could include the determination that the plant is no longer economically viable.

Should the plant be temporarily shutdown or closed, there would not be any significant socioeconomic impacts. The applicant would conduct a review to determine if there had been any environmental damage or release of hazardous materials. If not, the plant could be mothballed. Before the plant begins commercial operation, the applicant will develop a contingency plan to deal with premature or unexpected closures. This would include communication with the Energy Commission, the City of San Jose, and local agencies regarding schedule of facility closure and compliance with LORS.

In the event that the decision is made to permanently close the facility, the applicant will develop a plan for decommissioning that will be submitted to the Energy Commission and other appropriate agencies. The plan will include compliance with all applicable LORS. Should the plant be permanently closed, the beneficial socioeconomic impacts such as worker payroll, project expenditures, local economic stimulus, and property tax revenues would no longer occur.

RESPONSE TO PUBLIC AND AGENCY COMMENTS

SJ-2 and SJ-8 *The San Jose Department of Planning, Building and Code Enforcement commented that the MEC may not be the type of project that can maximize the economic potential of the North Coyote Valley (City of San Jose 2000).* They submitted a calculation to staff that showed a campus industrial project built on the proposed MEC site, would have a potential for approximately 98,000 square feet of development and generate approximately 294 jobs (Prevetti 2000). Staff has requested additional information to compare the difference in property taxes and other economic impacts of the two types of projects. The City of San Jose has not provided the information to date.

AH-2 *A comment from the public was received expressing concern about the power plant lowering the value of all surrounding homes and property.* As noted in the discussion of property values above, both the applicant and a consultant hired by staff reviewed the literature on property value impacts from industrial activities. The applicant also analyzed possible effects on property values and housing price and sales trends in the area around the MEC. Staff's consultant reviewed these analyses and summarized the findings. In general, there is no information or study that demonstrates an adverse impact on property values directly attributable to a natural gas fired power plant.

CONCLUSIONS AND RECOMMENDATIONS

Staff believes that the MEC would not cause a significant adverse direct or cumulative impact on housing, employment, schools, public services or utilities. Provisions for additional fire protection services for the MEC and other proposed development projects are required. Condition of Certification 3 in **Worker Safety and Fire Protection** addresses this issue. The MEC would benefit the City of San Jose and adjacent areas in terms of an increase in local jobs and commercial activity during the construction and operation of the facility. The construction payroll and project expenditures would also have a positive effect on the local and county economy. The estimated benefits from the project include increases in the affected area's property and sales taxes, employment, and sales of services, manufactured goods, and equipment. The estimated annual operating budget will be \$2 to \$4 million. Overall, staff believes that the project will have a positive socioeconomic impact on the San Jose area.

The project, as proposed, would be consistent with all applicable socioeconomic LORS. The proposed conditions of certification ensure the compliance with LORS, that anticipated local benefits occur to the extent feasible, and that the one-time assessment fee is paid to the Morgan Hill Unified School District. In addition, the conditions create a mechanism for acquiring fire department equipment and staff to be funded through a fair share agreement.

If the Energy Commission certifies the proposed project, staff recommends that it adopt the following conditions of certification.

PROPOSED CONDITIONS OF CERTIFICATION

SOCIO-1 The project owner and its contractors and subcontractors shall recruit employees and procure materials and supplies within the City of San Jose and Santa Clara County first unless:

- to do so will violate federal and/or state statutes;
- the materials and/or supplies are not available; or
- qualified employees for specific jobs or positions are not available; or
- there is a reasonable basis to hire someone for a specific position from outside the local area.

Verification At least sixty (60) days prior to the start of earth moving activities, the project owner shall submit to the Energy Commission Compliance Project Manager (CPM) copies of contractor, subcontractor, and vendor solicitations and guidelines stating hiring and procurement requirements and procedures. In addition, the project owner shall notify the CPM in each Monthly Compliance Report of the reasons for any planned procurement of materials or hiring outside the local regional area that will occur during the next two months.

SOCIO-2 The project owner shall pay the one-time statutory school facility development fee as required at the time of filing for the in-lieu building permit with the San Jose Building Department.

Verification: The project owner shall provide proof of payment of the statutory development fee in the next Monthly Compliance Report following the payment.

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BIOLOGICAL RESOURCES

Testimony of Linda Spiegel

INTRODUCTION

This section provides the Energy Commission final staff analysis (FSA) of potential impacts to biological resources from the construction and operation of the Metcalf Energy Center (MEC) proposed by Calpine Corporation and Bechtel Enterprises, Inc. This analysis addresses potential impacts to state and federally listed species, species of special concern, and areas of critical biological concern; describes the biological resources of the project site and at the locations of appurtenant facilities; determines the need for mitigation and the adequacy of mitigation proposed by the applicant; and, where necessary, specifies additional mitigation measures to reduce identified impacts to less than significant levels. It also determines compliance with applicable laws, ordinances, regulations and standards (LORS), and recommends conditions of certification.

This analysis is based, in part, upon information provided in Calpine/Bechtel's Application for Certification (AFC) (Calpine/Bechtel 1999a), Supplemental Filings (Calpine/Bechtel 1999b, 2000a), site visits, workshops, staff data requests and applicant responses (Calpine/Bechtel 1999cdef, 2000bcdefghi), a Biological Assessment and supplement (Calpine/Bechtel 2000dj), and discussions with various agency representatives.

LAWS, ORDINANCES, REGULATION, AND STANDARDS

FEDERAL

ENDANGERED SPECIES ACT OF 1973

Title 16, United States Code (USC), section 1531 et seq., and Title 50, Code of Federal Regulations, part 17.1 et seq., designate and provide for protection of threatened and endangered plant and animal species, and their critical habitat.

MIGRATORY BIRD TREATY ACT

Title 16, United States Code, sections 703 - 712, prohibits the take of migratory birds.

CLEAN WATER ACT

33 USC, section 404 et seq., prohibits the discharge of dredged or fill material into the waters of the United States without a permit. Nationwide permit (NWP) 7 is required to construct an outfall structure and the effluent is authorized under the National Pollution Discharge Elimination System program (Section 402).

STATE

CALIFORNIA ENDANGERED SPECIES ACT OF 1984

Fish and Game Code sections 2050 et seq. protects California's rare, threatened, and endangered species.

NEST OR EGGS

Fish and Game Code section 3503 protects California's birds by making it unlawful to take, possess, or needlessly destroy the nest or eggs or any bird.

BIRDS OF PREY OR EGGS

Fish and Game Code section 3503.5 protects California's birds of prey and their eggs by making it unlawful to take, possess, or destroy any birds of prey or to take, possess, or destroy the nest or eggs of any such bird.

MIGRATORY BIRDS

Fish and Game Code section 3513 protects California's migratory birds by making it unlawful to take or possess any migratory nongame bird as designated in the Migratory Bird Treaty Act or any part of such migratory nongame bird.

FULLY PROTECTED SPECIES

Fish and Game Code sections 3511, 4700, 5050, and 5515 prohibits take of animals that are classified as Fully Protected in California.

SIGNIFICANT NATURAL AREAS

Fish and Game Code section 1930 et seq. designates certain areas such as refuges, natural sloughs, riparian areas and vernal pools as significant wildlife habitat.

STREAMBED ALTERATION AGREEMENT

Fish and Game Code section 1600 et seq. requires California Department of Fish and Game to review project impacts to waterways, including impacts to vegetation and wildlife from sediment, diversions and other disturbances.

NATIVE PLANT PROTECTION ACT OF 1977

Fish and Game Code section 1900 et seq. designates state rare, threatened, and endangered plants.

CALIFORNIA CODE OF REGULATIONS

Title 14, sections 670.2 and 670.5 list animals of California designated as threatened or endangered.

LOCAL

SANTA CLARA COUNTY GENERAL PLAN

Policy R-RC19 requests that habitat types and biodiversity be maintained and enhanced. Policy R-RC 24 requests that areas of particularly fragile ecological nature or necessary for preserving threatened or endangered species receive special consideration for preservation and protection from development impacts.

SANTA CLARA COUNTY TREE ORDINANCE

NS-1203.107, Sec. C16-2(c) and (j) and Sec C16-3 defines Heritage and ordinance trees and prohibits removal without a permit.

CITY OF SAN JOSE 2020 GENERAL PLAN

WOODLANDS, GRASSLANDS, CHAPARRAL AND SCRUB POLICIES

Number 8: Serpentine grasslands should be preserved and protected to greatest extent feasible or appropriate measures should be taken to restore or compensate.

BAY AND BAYLANDS POLICIES

Number 5: The City should continue to participate in the Santa Clara Valley Non-Point Source Pollution Control Program and meet regional water quality standards implemented through the National Pollution Discharge Elimination System Permits.

SPECIES OF CONCERN POLICIES

Number 1: Consideration should be given to setting aside conservation areas in the Bay and baylands, along riparian corridors, upland wetlands, and hillside areas to protect habitats of unique, threatened and endangered species.

Number 2: Habitats that support Species of Concern should be retained to the greatest extent feasible.

URBAN FOREST POLICIES

Number 2: Development projects should include the preservation of ordinance-sized trees, and other significant trees.

Number 8: Where urban development occurs adjacent to natural plant communities (e.g. riparian forest), landscape plantings should incorporate tree species native to the area to the greatest extent feasible.

CITY OF SAN JOSE RIPARIAN CORRIDOR POLICY

GUIDELINE 1C: SETBACK AREAS

All buildings, other structures, impervious surfaces, outdoor activity areas and ornamental landscaped areas should be separated a minimum of 100 feet from the edge of the riparian corridor (or top of bank, whichever is greater).

GUIDELINE 2C: VISUAL AND GUIDELINE 2E: LIGHTING

Development projects should be designed to minimize potential impacts to adjacent riparian habitat through the use of environmentally sensitive construction materials/activities, specialized lighting features and native landscaping.

GUIDELINE 2F: NOISE

The operation of mechanical equipment within or adjacent to riparian corridors should not exceed noise levels for open space as specified in the Noise Element of the City of San Jose's General Plan. Noise producing stationary equipment should be located as far as necessary from riparian corridors to preclude exceeding the ambient noise level in the corridors.

GUIDELINE 6B: VEGETATION REMOVAL

Vegetation removal in riparian areas should be performed only for floodway maintenance or to remove undesirable exotic plants. Herbicides should only be used where manual and mechanical methods are infeasible. If vegetation removal is required as a part of project design, tree removal should be reviewed with the City Arborist. A 3:1 habitat replacement ratio is required and revegetation plans should be reviewed by the City.

GUIDELINE 6D: HERBICIDES

Herbicide use within and adjacent to riparian corridors should be limited to those specifically labeled for use adjacent to water courses.

GUIDELINE 6E: NON-NATIVE PLANT REMOVAL

Invasive, non-native plants should be removed and replaced with native plants in the portion of the riparian corridor adjacent to the property to be developed.

GUIDELINE 7B: WATER QUALITY/DRAINAGE AND RUNOFF

The direct discharge of industrial effluent into the riparian channel, corridor, or floodplain is prohibited. Runoff from industrial uses should be directed away from direct entry to the riparian corridor, or Best Management Practices should be provided and permanently maintained and on-site retention areas used.

ORDINANCE-SIZED TREES AND HERITAGE TREES

City of San Jose Civil Code, Title 13.28.330 –13.28.360 defines and protects Heritage Trees. Title 13.31.010 to 13.32.100 prohibits the removal of trees that are 56 inches or greater at 24 inches above the natural grade or slope without a permit.

SETTING

REGIONAL DESCRIPTION

The proposed project site is located in the Santa Clara Valley within the Urban Service Area of south San Jose and just north of the town of Coyote. The Santa Clara Valley is bordered by the Santa Cruz Mountains to the west and the Diablo Range to the east. The 20-acre MEC site is situated southeast of the base of Tulare Hill and directly adjacent to Fisher Creek. Land use types of the Santa Clara Valley proper consist of residential, commercial, industrial, agriculture, and open space. Special-status species known to occur in the vicinity or identified during field surveys are listed in **Biological Resources Table 1**, following this section.

SERPENTINE HABITATS

The surrounding hills, including Coyote Ridge to the east, Santa Teresa Hills to the west and Tulare Hill, contain soils derived from serpentine rock and support unique serpentine grasslands, considered a sensitive habitat by the California Department of Fish and Game (CDFG; CNDDDB 1999). Serpentine-based rock represents only about one percent of California's geologic base, yet contain 10 percent of California's native flora. Serpentine soils are found in parts of eight counties within the San Francisco Bay Area: Alameda, Contra Costa, Marin, Napa, San Francisco, San Mateo, Santa Clara, and Sonoma.

Serpentine soils provide harsh conditions for plant growth including a low calcium to magnesium ratio, lack of nitrogen, potassium, and phosphorous that are essential to plant growth, and high concentrations of heavy metals that are toxic to most plant life. Despite these conditions, serpentine habitats support proportionately high numbers of rare and/or endemic plant species. These endemics have developed several genetic adaptations to tolerate the serpentine environments and have been able to persist due to the lack of competition from nonnative species that are intolerant to serpentine conditions.

Serpentine habitats also support endemic or nearly endemic invertebrates such as the federally threatened bay checkerspot butterfly (*Occiddayas editha* spp. *bayensis*) whose primary larval host plant, dwarf plantain (*Plantago erecta*), is abundant on serpentine soils. The Opler's longhorn moth (*Adela oplerella*), a federal species of concern, is found exclusively on its host plant, California cream cups (*Platystemon californicus*), in serpentine soils. The Edgewood blind harvestman (*Calicina sitalcina minor*), also a federal species of concern, are restricted to serpentine soils in the San Francisco Bay Area.

Tulare Hill is a serpentine formation in the center of Santa Clara Valley, immediately west of the MEC site and serves as a stepping stone connection between the serpentine habitats of the Santa Cruz Mountains and Diablo Range. The peak elevation is 565 feet above mean sea level. The federally endangered Santa Clara Valley dudleya (*Dudleya setchellii*) and several invertebrate host species (dwarf plantain, California cream cups, and owl's clover) occur on the hill. Tulare Hill supports the bay checkerspot butterfly during productive years and is listed as a

high priority area for this species and an important area for the Opler's longhorn moth in the *Recovery Plan for Serpentine Soil Species of the San Francisco Bay Area* (USFWS 1998). The surrounding Coyote Ridge and Santa Teresa Hills are considered core areas and high priority areas, respectively, for the butterfly (USFWS 1998).

FISHER AND COYOTE CREEKS

Fisher Creek is a tributary to Coyote Creek that flows from the Santa Teresa Hills into the Santa Clara Valley along the southern and eastern base of Tulare Hill. Fisher Creek, originally named Laguna Seca Creek, was excavated and channelized in the late 1800's to drain Laguna Seca Lake, west of Santa Teresa Boulevard. This creek receives water from groundwater inflow and surface runoff. During summer months, creek flows are approximately 300 acre-feet/year or dry during drought periods (Calpine/Bechtel 2000efg). Fisher Creek supports intermittent occurrences of riparian habitat and sparse vegetation due to disturbance from cattle grazing. Various waterfowl and water birds and warm water fish species occur in Fisher Creek. No special status species are known to occur, but the creek could provide dispersal habitat for the California tiger salamander (*Ambystoma californiense*; federal candidate) and California red-legged frog (*Rana aurora* spp. *draytonii*; federally threatened; Brown, pers comm. 1999). Mt. Hamilton thistle (*Cirsium hamiltonii*), a federal species of concern and California Native Plant Society (CNPS) list 1B plant, was observed along Fisher Creek, southwest of the MEC site in 1991. However, the plant was not observed during surveys conducted in March and May of 1999 (Calpine/Bechtel 1999c).

Coyote Creek flows northward into the San Francisco Bay, 38 miles from the MEC site. Flow from Coyote Creek is diverted by the Santa Clara Valley Water District (SCVWD) into the Coyote Canal about one mile north of Anderson Reservoir and is returned to Coyote Creek about three-fourths of a mile south of Fisher Creek. Because of this diversion, and because Coyote Creek is not fed by groundwater, flows from April to October are about 15 cubic-feet per second (Calpine/Bechtel 2000efg). During heavy rain storms, Coyote Creek backflows into Fisher Creek via a culvert under Monterey Road. Landowners constructed a 50-foot wide earthen levee along Fisher Creek from Santa Teresa Boulevard to Monterey Road to prevent flooding onto adjacent lands. The Coyote Creek riparian corridor is a significant feature of the Santa Clara landscape and supports several riparian trees, shrubs, and associated wildlife. Coyote Creek contains habitat for both cold and warm water fish species, including the fall-run chinook salmon (*Oncorhynchus tshawytscha*), is a migration corridor for neotropical migrants, and provides potential breeding and migration habitat for the western pond turtle (*Clemmys marmorata*; federal species of concern), California red-legged frog, and California tiger salamander. Due to fish screen issues and challenges by concerned entities, SCVWD has not operated the Coyote Canal for the past two years and is developing a Coyote Creek management plan to address impacts to special-status species and improvements to habitat quality (Calpine/Bechtel 2000f).

ORDINANCE TREES

Santa Clara County defines ordinance trees as any tree with a diameter at breast height (DBH) of 12 inches or greater at 4.5 feet above ground surface. The City of San Jose defines ordinance trees as any tree having a circumference of 56 inches measured 24 inches above natural grade slope. Removal of ordinance trees requires city and county permits. Ordinance trees in the project vicinity include Valley oak (*Quercus lobata*), elderberry (*Sambucus mexicana*), English walnut (*Juglans regia*), olive (*Lea europaea*), pear (*Malus* sp.), and California coffeeberry (*Rhamnus californica* spp. *californica*). Heritage trees are defined by the city to have a special significance to the community because of a unique quality, species, size, or historic value. Keesling black walnut trees, planted by Horace G. Keesling in the early 1900's, occur throughout the Santa Clara Valley, particularly along Monterey Road. The Keesling black walnut trees were designated by the State of California as a Point of Historical Interest in the mid 1980's. A large grove of black walnut trees were planted along the southeastern border of the MEC site; however, these are not listed as Heritage Trees.

SITE VICINITY

POWER PLANT SITE AND LAYDOWN AREA

The proposed MEC site is bordered by Monterey Road and the UPRR railroad tracks on the east, Tulare Hill and Fisher Creek on the north and west, and an agricultural field that extends to Blanchard Road to the south. The power plant will require 10.7 acres for the footprint, including generation facilities, storage tanks, parking area, administration building, water treatment, switchyard, and stormwater detention pond. The site supports elderberry savanna that may be considered potential upland habitat for red-legged frogs. However, the site has been highly disturbed by the current tenant and is littered with old cars, trailers, and debris and has several pens holding hundreds of roosters. The area has been severely overgrazed by cattle and goats. Approximately 80 trees are located within the construction area. A temporary construction laydown area will require 12 acres of agricultural land south of the MEC site.

The MEC site has been reconfigured from the original plan provided in the AFC to include a 100-foot setback from the Fisher Creek riparian corridor, in accordance with the City of San Jose's *Riparian Corridor Policy Study* (City of San Jose 1999, Calpine/Bechtel 2000a). The riparian corridor is defined as the entire area within the banks of the creek extending to the top of the bank and encompassing the dripline of riparian trees. The MEC footprint will be elevated to 255 feet with the edge sloping into the setback. A 75-foot wide temporary construction area will be within the riparian corridor on the west side of the cooling tower. A stormwater detention pond located at the southern end of the site will consist of a discharge pipe placed through the Fisher Creek levee and release collected stormwater into Fisher Creek.

The area of Fisher Creek that is adjacent to the MEC site is mostly disturbed from over grazing of cattle. A total of 81 trees, dominated by Valley oak and red willow

(*Salix laevigata*), and two shrub species, elderberry and mule fat (*Baccharis viminea*), were identified within the corridor (Calpine/Bechtel 2000b). Fisher Creek has a 50-foot wide levee along the eastern and southern banks. The majority of the riparian vegetation occurs along a band between the top of the inside bank of the levee and the creek. A portion of the levee near the north side of the MEC site has been breached by a Pacific Gas and Electric maintenance easement to access transmission towers and power lines on Tulare Hill.

A roughly graded road located along the western side of Fisher Creek at the base of Tulare Hill functions as a partial levee (about 5 feet lower than the levee across the creek). Intensive grazing of the area has severely disturbed the site as evidenced by bare soil areas and erosion. A natural spring on the southeast flank of Tulare Hill forms a 0.5-acre wetland at the toe of the hill. The wetland is currently overgrazed and trampled by cattle. Water from the spring is collected by hoses and barrels and transported to the MEC site by the current tenant. The southwestern slope of Tulare Hill supports western burrowing owls (*Speotyto cunicularia hypugea*), Santa Clara Valley dudleya, and bay checkerspot butterflies and host plant species. The Hill also supports Opler's loghorn moth and host plant species and may support Edgewood blind harvestman. Historic observations of Metcalf Canyon jewel-flower (*Streptanthus albidus* ssp. *albidus*) a federally endangered species, are known for the northwest flank of the Hill.

ACCESS ROAD AND LANDSCAPE CORRIDOR

A 150-foot wide access road and landscape corridor is proposed just west of the UPRR tracks, extending from the MEC site south to Blanchard Road. The habitats along this proposed road include 6 acres of agricultural land, ruderal grassland and a row of small trees near the MEC site. If city streets are developed for the proposed Coyote Valley Research Park and MEC is granted access rights, a western access road will be constructed to parallel Fisher Creek (at a distance of at least 100 feet from the riparian setback area) from MEC to Santa Teresa Boulevard (Calpine/Bechtel 2000hi). The habitats along this route are 2.5 acres of agricultural land, farm roads, and annual grasslands. No sensitive species were found in these areas. However, Mt. Hamilton thistle was observed along Fisher Creek in 1991 (Calpine/Bechtel 1999c).

WATER SUPPLY AND DISPOSAL

Recycled water will be supplied by the South Bay Water Recycling Program. The water will be delivered from the San Jose/Santa Clara Water Pollution Control Plant via a 10.3-mile 20-inch pipeline through San Jose city streets to MEC (SBWR route; Supplement A). The new portion of the pipeline route begins at Sender Road and runs down the middle of city streets to Santa Teresa Boulevard, just south of Fisher Creek. This pipeline will then be placed within agricultural land from Santa Teresa Boulevard to the MEC site. Cooling process water blowdown (wastewater) and sanitary wastes will be discharged into the San Jose sewer via a 12-inch pipe, running in the same trench through agriculture land as the supply pipe, that will connect to an existing sewer at Santa Teresa Boulevard. If the western access road is built, pipelines would be placed under the road. The wastewater will be treated at the Water Pollution Control Plant before being discharged into the San Francisco

Bay under an existing National Pollution Discharge Elimination System (NPDES) permit (see **Water Resources** section).

Verification: Domestic water and process makeup water for the heat recovery steam generators (HRSG's) will be supplied by San Jose MUNI via a 1.25-mile pipeline along the west side of the UPPR tracks from Bailey Avenue to the MEC site. This area is along the proposed access road and is currently in agricultural production.

NATURAL GAS PIPELINE

Natural gas will be delivered via a new 16-inch pipe from the MEC site to an existing PG&E pipe located east of U.S. 101. The pipeline travels from MEC south along the proposed access road to Blanchard Avenue, under the UPPR tracks, Monterey Road, and Coyote Creek, follows Coyote Ranch Road to U.S.101, and under U.S. 101. The pipeline will be constructed using horizontal directional drilling methods to avoid the Coyote Creek corridor. Other portions of the route will follow existing roads. The County of Santa Clara requires a 150-foot setback from Coyote Creek and that the drilling sites avoid any sensitive areas (Ryan, pers comm, 2000).

TRANSMISSION LINE

A new 240-foot long transmission line will run from the MEC site northwest to an existing 230-kV line at the top of Tulare Hill. The new line will span Fisher Creek approximately 70 to 170 feet above ground, approximately 50-ft or more above the riparian tree canopy. Tulare Hill supports several sensitive serpentine endemics, including the bay checkerspot butterfly host plant species and Santa Clara Valley dudleya. A burrowing owl and den were observed on the west face of the hill during surveys.

IMPACTS

PROJECT SPECIFIC DIRECT AND INDIRECT IMPACTS

DIRECT IMPACTS

The MEC project has been designed to reduce direct impacts to sensitive biological resources. The power plant, laydown area, and access roads are located in disturbed habitats or agricultural fields. The power plant is positioned to adhere to a 100-foot setback from the Fisher Creek riparian corridor. The pipeline routes are mostly located in roadways and agricultural fields, and will be horizontal directional drilled to avoid sensitive habitats such as Coyote Creek and its associated riparian corridor by a distance of 500 feet.

BIOLOGICAL RESOURCES Table 1
Special Status Species within the Vicinity of the Metcalf Energy Center

Species Name	Regulatory Status [#]	Suitable Habitat for the Species [†]	Known Occurrence In Project Area
Habitats			
Serpentine bunchgrass	NA	Serpentine soils	Known occurrence on Tulare Hill, Coyote Ridge, and Santa Teresa Hills.
Sycamore alluvial woodland	NA	RIP	Coyote Creek riparian corridor.
Winter-run chinook salmon critical habitat	FE	SF Bay	Critical habitat not in project area.
Delta smelt critical habitat	FT	R (Bay-Delta)	Critical habitat not in project area.
Plants			
Contra Costa goldfields <i>Lasthenia conjugens</i>	1B, FE	AG mesic, VP	No suitable habitat in MEC impact areas and none observed during surveys.
Coyote ceanothus <i>Ceanothus ferrisiae</i>	FE, 1B	CH, AG, SB, CS	No suitable habitat in MEC impact areas and none observed during surveys.
Fragrant fritillary <i>Fritillaria liliacea</i>	1B, SC	AG	Suitable habitat in project area, but none observed during surveys in impact areas.
Hall's bush mallow <i>Malacothamnus hallii</i>	1B	CH	No suitable habitat in MEC impact areas and none observed during surveys.
Metcalf Canyon jewel-flower <i>Streptanthus albidus</i> ssp. <i>Albidus</i>	FE, 1B	SB	Historic occurrences on northwest flank of Tulare Hill, but none observed during surveys. May be extirpated from hill (Elam et al. 1998).
Most beautiful jewel-flower <i>Streptanthus albidus</i> ssp. <i>Peramoenus</i>	SC, 1B	SB, CH	Suitable habitat in project area, but none observed during surveys in impact areas.
Mt. Diablo phacelia <i>Phacelia phacelioides</i>	SC	CH	No suitable habitat in MEC impact areas and none observed during surveys.
Mt. Hamilton coreopsis <i>Coreopsis hamiltonii</i>	SC, 1B	CW, rocky	No suitable habitat in MEC impact areas and none observed during surveys.
Mt. Hamilton thistle <i>Cirsium fontinale</i> var. <i>campylon</i>	SC, 1B	CH, AG, SB, OW	Known occurrence along Fisher Creek south of Tulare Hill and in Coyote Creek pond area south of the proposed MEC gas pipeline.
Pappose spikeweed	SC	AG	No suitable habitat in MEC impact

Species Name	Regulatory Status [#]	Suitable Habitat for the Species [†]	Known Occurrence In Project Area
<i>Hemizonia parryi</i> ssp. <i>Congdonii</i>		alkaline	areas and none observed during surveys.
Rock sanicle	SC,	CH	No suitable habitat in MEC impact areas and none observed during surveys.
<i>Sanicula saxatilis</i>	CR, 1B	(rocky)	
Santa Clara red ribbons or South Bay clarkia	SC, 1B	CW, CH	No suitable habitat in MEC impact areas and none observed during surveys.
<i>Clarkia concinna</i> ssp. <i>Automixa</i>			
Santa Clara Valley dudleya	FE, 1B	SB rocky outcrops	Known occurrences on serpentine outcrop areas of Tulare Hill and found during surveys, but not in construction zone.
<i>Dudleya setchellii</i>			
Smooth lessingia	SC, 1B	CH, SB	Suitable habitat in project area, but none observed during surveys in impact areas.
<i>Lessingia micradenia</i> var. <i>glabrata</i>			
Tiburon Indian paintbrush	FE, CT, 1B	SB (rocky), AG	Suitable habitat in project area, but none observed during surveys in impact areas.
<i>Castilleja affinis</i> ssp. <i>Neglecta</i>			
Invertebrates			
Bay checkerspot butterfly	FT	SB	Known habitat and occurrences on Tulare Hill assumed present.
<i>Occidryas editha</i> ssp. <i>Bayensis</i>			
Edgewood blind harvestman	SC	SB	Potential habitat in moist areas of Tulare Hill, but not found during surveys.
<i>Calicina sitalcina minor</i>			
Opler's longhorn moth	SC	SB	Known population occurrence on Tulare Hill assumed present.
<i>Adela oplerella</i>			
Ricksecker's water scavenger beetle	SC	VP, W	No suitable habitat in MEC impact areas and none observed during surveys.
<i>Hydrochara rickseckeri</i>			
Unsilvered fritillary butterfly	SC	CW	No suitable habitat in MEC impact areas and none observed during surveys.
<i>Speyeria adiastrae</i>			
<i>adiastrae</i>			
Fish			
Central California Coast steelhead	FT	R	Potential migration and spawning habitat in Coyote Creek.
<i>Oncorhynchus mykiss</i>			
Fall/late fall-run chinook salmon	C	R	Potential migration and spawning habitat in Coyote Creek.
<i>Oncorhynchus tshawytscha</i>			

Species Name	Regulatory Status [#]	Suitable Habitat for the Species [†]	Known Occurrence In Project Area
Spring-run chinook salmon <i>Oncorhynchus tshawytscha</i>	FT	R	Project area outside distribution of species.
Delta smelt <i>Hypomesus transpacificus</i>	FT, ST	R, SL	Project area outside distribution of species.
Longfin smelt <i>Spirinchus thaleichthys</i>	SC	R	Project area outside distribution of species.
Sacramento splittail <i>Pogonichthys macrolepidotus</i>	FT	R, SL	Potential spawning habitat in Coyote Creek.
Winter-run chinook salmon <i>Oncorhynchus tshawytscha</i>	FE, SE	R	Project area outside distribution of species.
Reptiles and Amphibians			
California horned lizard <i>Phrynosoma coronatum</i> ssp. <i>frontale</i>	SC	OW, RIP, CH, ID	No suitable habitat in project impact area.
California red-legged frog <i>Rana aurora</i> ssp. <i>draytonii</i>	FT	SL, W	Known historic occurrence from upper Fisher Creek drainage. Potential dispersal habitat along Fisher and Coyote creeks.
California tiger salamander <i>Ambystoma californiense</i>	C	AG, VP	Potential dispersal and aestivation habitat along Fisher creek.
Foothill yellow-legged frog <i>Rana boylei</i>	SC	R (with rocky bottom)	No suitable habitat in project impact area.
Western pond turtle <i>Clemmys marmorata</i>	SC	SL, R, W	Potential habitat in ponds of Fisher Creek and Coyote Creek.
San Joaquin coachwhip <i>Masticophis flagellum ruddocki</i>	SC	AG, OW, CH	No suitable habitat in project impact area.
Silvery legless lizard <i>Anniella pulchra pulchra</i>	SC	ID	No suitable habitat in project impact area.
Western spadefoot toad <i>Scaphiopus hammondi</i>	SC, CSC	AG, VP, OW	No suitable breeding habitat in project area, rarely roams far from breeding areas.
Birds			
American peregrine falcon <i>Falco peregrinus</i>	SE, FP, (FE-	AG, W	Potential occasional winter forage on Tulare Hill and agriculture land.

Species Name	Regulatory Status [#]	Suitable Habitat for the Species [†]	Known Occurrence In Project Area
<i>anatum</i>	delisted)		
Bald eagle	FT, SE	AG	No suitable habitat in project area.
<i>Haliaeetus leucocephalus</i>			
Bell's sage sparrow	SC	CH	No suitable habitat in project area.
<i>Amphispiza belli belli</i>			
Black swift	CSC	Cliffs near waterfall	None observed during surveys.
<i>Seloides niger</i> (nesting)		s	
Great blue heron (rookery site)	CSC	RIP	Potential rookery habitat in Coyote Creek corridor, none observed during surveys.
<i>Ardea herodias</i>			
Ferruginous hawk	SC, CSC	AG	Potential occasional winter forage on Tulare Hill and agriculture land.
<i>Buteo regalis</i>			
Little willow flycatcher	SE	Willow thicket at >2,000' elevation	No suitable habitat in project area.
<i>Empidonax traillii brewsteri</i>		CW, MA	
Marbled murrelet	FT		No suitable habitat in project area.
<i>Brachyramphus marmoratus</i>			
Tricolored blackbird	SC, CSC	W, C	Potential suitable habitat along portions of Fisher Creek. None observed in project area.
<i>Agelaius tricolor</i>			
White-tailed kite	SC, FP	AG, RIP	Potential for nesting in trees on MEC site and Coyote Creek riparian corridor and forage on Tulare Hill and crop lands.
<i>Elanus leucurus</i>			
Western burrowing owl	SC, CSC	AG	One owl and den observed on Tulare Hill in February 1999 above MEC project site.
<i>Athene cunicularia</i> ssp. <i>hypugea</i>			
Golden eagle	FP, CSC	AG, CS	Known to nest at Calero Reservoir; observed foraging on Tulare Hill and Coyote Ridge.
<i>Aquila chrysaetos</i>			
Mammals			
Fringed myotis bat	SC	OW	Potential habitat along Coyote Creek riparian corridor.
<i>Myotis thysanodes</i>			
Greater western mastiff bat	SC, CSC	OW, CS, CH	Potential habitat along Coyote Creek riparian corridor.
<i>Eumops perotis californicus</i>			
Long-eared myotis bat	SC	OW	Potential habitat along Coyote Creek riparian corridor.
<i>Myotis evotis</i>			
Long-legged myotis bat	SC	CH, OW	Potential habitat along Coyote

Species Name	Regulatory Status [#]	Suitable Habitat for the Species [†]	Known Occurrence In Project Area
<i>Myotis volans</i>			Creek riparian corridor.
Pacific western big-eared bat	SC, CSC	OW	Potential habitat along Coyote Creek riparian corridor.
<i>Plecotus townsendii townsendii</i>			
Small-footed myotis bat	SC	OW	Potential habitat along Coyote Creek riparian corridor.
<i>Myotis ciliolabrum</i>			
Yuma myotis bat	SC, CSC	RIP, CH	Potential habitat along Coyote Creek riparian corridor.
<i>Myotis yumanensis</i>			
Riparian brush rabbit	FE, SE	OW, RIP	Potential habitat along Coyote Creek riparian corridor. None observed during surveys.
<i>Sylvilagus bachmani riparius</i>			
San Francisco dusky-footed woodrat	SC, CSC	CH, RIP	Potential habitat in Fisher Creek riparian corridor. None observed near MEC site.
<i>Neotoma fuscipes annectens</i>			
San Joaquin kit fox	FE, ST	AG	Known historic (1975) habitat east of U.S. 101 on Coyote Ridge.
<i>Vulpes macrotis mutica</i>			

[#] Federal-, state-, and CNPS-listed species.
FE: Federally Endangered.
FT: Federally Threatened.
SC: Federal Species of Concern.
PE: Federal Proposed Endangered.
PT: Federal Proposed Threatened.
C: Candidate Species for Listing
SE: California Endangered.
ST: California Threatened.
CPE: California Proposed Endangered.
CSC: California Species of Special Concern.
FP: California Fully-Protected species.
CR: California Rare.
1A: Extinct.
1B: CNPS rare or endangered in California and elsewhere.
2: CNPS rare or endangered in California, more common elsewhere.

[†] Abbreviations for habitat areas.
AG: Annual grassland.
AW: Alkali wetlands.
C: Crop.
CH: Chaparral.
CS: Coastal sage scrub.
CW: Coniferous woodland.
ID: Interior dunes.
MA: Marine.
OW: Oak woodland.
R: River system and tributaries, open water.
RIP: Riparian habitat along Coyote Creek.
SB: Serpentine bunchgrass.
SL: Sloughs, slow moving water, lake.
W: Wetland habitat; fresh and/or brackish.
VP: Vernal pool.

Direct impacts associated with the project are:

- Loss of potential red-legged frog upland habitat.
- Temporary loss of 10,500 square feet of serpentine habitat from the connection of the new transmission line to the existing line.
- Potential bird collisions with the new 240-ft transmission line and two 145-ft tall HRGS's stacks.
- Temporary disturbance to the riparian corridor from construction activities.
- Water quality degradation from stormwater discharge into Fisher Creek.
- Loss of 80 trees, of which 59 fall under the definition of Santa Clara County significant tree and 53 fall under the definition of the City of San Jose significant tree.

The MEC site supports disturbed elderberry savanna that could be considered potential California red-legged frog upland habitat. During wet weather, starting in fall, dispersing frogs use upland habitats. In summer if water is not available, frogs may leave their breeding aquatic habitats and seek refuge under rocks, logs, organic debris, or small mammal burrows. The California ground squirrel burrows along and adjacent to Fisher Creek could provide such refugia. The Fisher Creek corridor is considered marginal red-legged frog habitat by USFWS (Brown pers comm, 2000) and none were observed during surveys (Calpine/Bechtel 2000d). Nonetheless, restoring Fisher Creek and providing compensation habitat on Tulare Hill and Coyote Ridge would mitigate any loss of potential upland habitat.

Construction of the transmission line will require a crane and flatbed truck and will result in temporary disturbance to an area about 500 square feet on the south side of existing PG&E tower 0/6 and a 50-ft radius around the tower, for a total area of about 10,500 square feet (Crowe 2000, pers. comm). No grading or blading is required. The habitat is serpentine grasslands that support host plant species for the bay checkerspot butterfly and Opler's longhorn moth. Impacts to larvae could occur from soil compaction and dust. No Santa Clara Valley dudleya were observed in the impact area.

The new conductors and HRGS stacks should not result in high incidences of avian collisions. The new conductors will span Fisher Creek. Currently, the area is not heavily used by waterfowl; however, plans to restore the riparian corridor could result in increased use. Nonetheless, the span is short (240 ft total and 20 ft over Fisher Creek) and 50 feet above the creek and collisions would be rare. Bird collisions with the two 145-foot tall HRGS's stacks will also be unlikely or minimal. Most collisions occur at towers that are 300 feet or higher (Anderson, pers comm, 2000). Migrating song birds rarely fly at low heights; usually only during poor weather conditions. The MEC site is not known to be an optimal flight path. The presence of Tulare Hill and, once established, the new trees and power plant buildings would likely influence diurnal flight patterns enough for birds to avoid the stacks. Factors such as a high bird use area or migration route that would influence

a higher risk for collision (APLIC 1994) do not exist at the site. Therefore, the risk of avian collision is low and should not cause a significant impact.

To comply with the City of San Jose's *Riparian Corridor Policy Study* (City of San Jose 1999), Calpine/Bechtel redesigned the project so that all buildings, other structures, impervious surfaces, and ornamental landscape areas would be located outside the 100-foot setback from the riparian corridor (Calpine/Bechtel 2000ab). The edges of the elevated footprint would slope into the setback area for a distance of about 80 feet along the west and 60 feet from the bank along at the northwest corner. During construction, a temporary 75-foot construction area will be located within the riparian setback but outside the riparian corridor. Eleven non-riparian trees (7 black walnut, 3 English walnut, and 1 plum) will be removed. Eighty-one trees within the corridor will not be removed. The construction area will be restored and replanted with riparian trees after construction (Calpine/Bechtel 2000b, Appendix A). A 10-foot wide strip adjacent to the fence and within the 100-foot setback will be kept clear of vegetation using a herbicide considered safe to wildlife and water resources, such as Roundup. Currently, the vegetation in the riparian corridor is highly disturbed and fragmented, mostly from poorly managed cattle grazing. Replacement trees would be native species and the Tree Mitigation Planting Plan would add 4.3 acres of riparian habitat. Silt fencing, hay bales, and temporary settling ponds will be used to prevent silt and debris from entering Fisher Creek during construction. A permanent fence will be installed around the wetland and riparian corridor to prevent cattle trespass. Existing unnatural barriers to the spring that feeds the wetland will be removed. Restoration plans proposed by Calpine/Bechtel will enhance the value of the corridor for both wildlife and aquatic resources. Therefore, impacts from construction in the riparian corridor are temporary and not considered significant.

A stormwater detention basin will be constructed outside the riparian corridor in the southwest corner of the MEC site. Stormwater would be delivered to the basin via underground collection pipes that run throughout the plant site and diverted into Fisher Creek via a discharge pipe. The discharge pipe will run through the Fisher Creek levee, but will avoid riparian vegetation. Stormwater runoff will be isolated from spill containment areas and is not expected to be of poor quality. Runoff and discharge are monitored and controlled under a National Pollution Discharge Elimination System (NPDES) permit issued by the State Water Quality Control Board (See Water Resources Section). Under this permit, Calpine/Bechtel is required to prepare a stormwater pollution prevention plan that documents storage and handling of hazardous material and waste. Additionally, a Section 404 Permit (Nationwide Permit #7) and Streambed Alteration Agreement will be required by the Army Corps of Engineers and California Department of Fish and Game, respectively, to construct the outflow pipe.

A *Riparian Corridor Biotic Assessment and Tree Removal Plan* was developed by Calpine/Bechtel (2000b) in accordance with the requirement set forth in the City of San Jose's Riparian Corridor Policy (San Jose 1999) if a proposed project lies within or adjacent to a riparian corridor within the Urban Service Area. Trees on the MEC site were surveyed, measured, mapped and photographed by a biologist/forester. One hundred sixty one trees were documented on the MEC site.

Of these, 80 trees within the MEC site and temporary construction zone will be removed. While 11 of these are within the 100-foot setback area, none are within the riparian corridor proper (defined as the outer boundary of the existing riparian vegetation, including the dripline of trees). Of the 80 trees that will be removed, 59 are Santa Clara county ordinance trees. Currently, four of the 80 trees are within the City of Jose. These are not ordinance-sized trees (less than 12 inches diameter at breast height). If the MEC site is incorporated into the City of San Jose, 53 of the 80 trees meet the definition of city ordinance trees. Tree removal permits will be required from Santa Clara County and the City of San Jose.

INDIRECT IMPACTS

Indirect impacts associated with the construction and operation of the MEC project include:

- Temporary reduction in the number of trees that could potentially be used by birds for nesting and foraging.
- Artificial night lighting and noise.
- Nitrogen deposition on serpentine habitat.
- Emission and water use impacts to Fisher and Coyote Creeks.

The removal of 80 trees will result in the temporary loss of potential nesting and foraging habitat for raptors, songbirds, and water birds. No active nests were observed during surveys. Construction activities will likely reduce bird use in the area. However, bird use will likely resume and increase once construction and riparian enhancement measures are completed.

The City of San Jose's *Riparian Corridor Policy Study* require projects adjacent to riparian corridors to be designed to minimize potential impacts to wildlife from lighting (Guideline 2E) and noise (Guideline 2F). Lights can disorient migratory birds flying at night or attract wildlife, such as insects and insectivores. Special status bat species flying near the project would be of particular concern. While it is likely that some bat species occasionally forage in the area, surveys did not detect any bats using Fisher Creek (Calpine/Bechtel 2000d). The City of San Jose adopted Resolution No. 56286 which required low-pressure sodium illumination be used in the outdoor areas of new private developments in 1983, and revised this policy in June 2000 (City of San Jose 2000). The purpose of this policy is to promote energy efficiency while reducing night light pollution. In addition to the use of low-pressure sodium lighting, the policy requires that no light source be directed upward, that light sources producing more than 4,050 lumens be fully shielded to prevent light aimed upward and that light sources producing less than 4,050 lumens be partially shielded (City of San Jose 2000). Visual Resources Conditions of Certification (**VIS-3**) requires all lights be shielded and prohibits bulbs and reflectors from being visible from the riparian corridor. Staff believes that this condition will reduce any adverse impacts to nocturnal wildlife.

Calpine/Bechtel (2000b) determined that noise generated during operation of the facility is expected to be 60 dBA and noise generated during construction is

expected to be about 75 to 90 dBA. Commission staff estimated that operational noise at the riparian corridor would be 55 to 60 dBA L_{eq} . High levels of noise can cause hearing loss and other adverse physiological effects to wildlife. Continuous noise that masks the effective communication of meaning sounds (e.g. bird mating songs or warning calls) can interfere with behavioral functions. Both mammals and birds can suffer temporary hearing impairment from 24-hour exposure to noise levels of 80-110dB (CDT et.al. 1995). All vertebrates habituate or adapt behaviorally and physiologically to repeated exposure to noise either through sensitization or avoidance (Bowles 1995). Continuous sound pressure levels at 70 dB are considered a safe limit to wildlife (Bowles 1995). Continuous noise levels of 60dB from geothermal plant operations at the Geysers Resource Area in California did not seem to interfere with the behavior of wrentits in chaparral habitat (Leitner, pers comm. 2000). Wildlife use of Fisher Creek is currently low and intermittent noise is currently generated by road traffic on Monterey Road. Noise levels recorded 1,150 feet from the MEC site ranged from 42 dBA L_{eq} at 2:00 a.m. to 68 dBA L_{eq} at 5:57 p.m. (see Noise, Table 2). While operational noise levels of 60 dBA will exceed ambient levels by as much as 18 dBA during early morning hours (1:00 am to 4:00 a.m.), operational noise levels will not greatly exceed the mean ambient nighttime (10:00 p.m. to 7:00 a.m.) noise levels of 57 and 55 dBA recorded over two nights or the mean ambient daytime level of 58 dBA (see Noise). Because noise levels from operation will not exceed levels that can result in adverse effects on animal hearing or other physiological functions (80 dB; CDT et al. 1995, Leitner pers. comm. 2000), staff concludes that no significant adverse impacts are expected. Construction noise will likely temporarily reduce diurnal wildlife activity (e.g. birds) in the area.

MEC will operate two natural gas-fired combustion turbines HRSG's that will discharge exhaust gases into the atmosphere through 145-foot tall stacks. Emissions include sulfur dioxides, nitrogen dioxides (NO_x), and particulate matter with an aerodynamic diameter of 10 microns or less (PM₁₀). Additionally, ammonia (NH₃) emissions will occur as a by-product of the Selective Catalytic Reduction technology used to limit NO_x emissions. Of particular concern are impacts of the NO_x emissions on surrounding serpentine soils and their associated endemic species.

Nutrient-poor serpentine soils support an array of plant species specifically adapted to the soil conditions. Nitrogen is the primary limiting nutrient for plant growth on these soils, and the lack of adequate growth conditions has prevented the invasion of non-native grass species. In the vast majority of areas in California where serpentine soils do not exist, non-native grasslands have virtually eliminated native species and serpentine soils serve as the last refugia for many native grassland flora (Weiss 1999). Nitrogen deposition, primarily from industrial and vehicle emissions, artificially fertilize the soils, creating better conditions for the non-native species to persist and ultimately out-compete the native species. The displacement of serpentine endemics by non-native species, and subsequent decline in bay checkerspot butterfly individuals and plant host species, has been documented in the Santa Clara Valley (Weiss 1999).

Nitrogen atmospheric deposition in the Fremont and San Jose areas is reported to be 7 kg/ha-yr by the California Air Resources Control Board (CARB). These

estimates have an uncertainty value of 30 to 50 percent, resulting in estimates between 4 and 10.5 kg/ha-yr. Weiss (1999) adjusted these figures based on surface composition, seasonality of serpentine grasslands, and higher pollution levels in the South Bay Area to derive at deposition rates of 10 to 15 kg/ha-yr. These estimates have an uncertainty of 50 percent, for a range of 5 to 22.5 kg/ha-yr. CH2M Hill and Weiss (Calpine/Bechtel 2000j) made further adjustments to account for location differences and reductions in ambient NO_x and ozone values in the area to derive at an annual deposition rate in the vicinity of the MEC site of 8.4 kg/ha-yr. The nitrogen deposition rate considered sufficient to affect ecosystem structure and diversity is 3 to 10 kg/ha-yr. Therefore, the area already has levels of nitrogen that exceed this threshold. Weiss (1999) concluded that the transformation of serpentine soils and decline of bay checkerspot butterfly populations in the area are related to fertilization by atmospheric nitrogen deposition.

Tulare Hill supports host plant species, serpentine endemics, necessary for the survival of bay checkerspot butterfly and Opler's longhorn moth. More importantly, the surrounding Coyote Ridge and Kirby Canyon support important core areas for the bay checkerspot butterfly (USFWS 1998). These core areas support numbers of butterflies high enough to sustain the population. Without these core areas, butterfly numbers would decline to levels too low to maintain viable population levels.

Calpine/Bechtel prepared an *Impact Analysis for Metcalf Energy Center NO_x Emissions, Santa Clara County, California* to determine potential impacts from nitrogen deposition from MEC emissions on surrounding serpentine landscapes (Calpine/Bechtel 2000c). Wet and dry deposition were modeled using the Industrial Source Complex Short Term, Version 3 (ISCST3) model for gaseous pollutants. Conservative modeling assumptions were used to produce worse-case results, including the assumption that all nitrogen leaving the exhaust stacks would be in the form of depositional nitrogen (nitrate and ammonium ions). Ambient nitrogen levels were assumed to be 12.5 kg/ha-yr. The weighted average (assumes the nitrogen deposition is spread throughout a 32,400 meter-squared area) for deposition was determined to be 0.198 kg/ha/yr. Annual deposition of nitrogen on Tulare Hill and nearby Coyote Ridge from the operation of MEC alone were estimated to be 0.78 and 0.28 kg/ha-yr, respectively.

Calpine/Bechtel (2000j) then provided a revised calculation of nitrogen deposition from MEC as a supplement to its Biological Assessment. This revised analysis took into account the following:

- A reduction in annual operating NO_x emissions from 186 to 124 tons per year due to changes in project design.
- A reduction in the ammonia emissions from 237.2 to 118.6 tons per year.
- A revised estimate from Dr. Weiss of remaining undeveloped serpentine habitat in Santa Clara Valley from 6,677 to 3,176 acres.

- A revised background annual NO_x concentration from 12.5 to 8.4 kg-ha/yr.

From the analysis, the weighted average of annual deposition on serpentine habitat was determined to be 0.107 kg-ha/yr. Calpine/Bechtel also provided maps showing direct deposition using values that do not assume an evenly distributed deposition over a widespread area (not using a weighted average). These maps show estimated annual direct and cumulative depositions of nitrogen to be 1.13 and 1.5 kg-ha/yr on Tulare Hill and 0.13 and 3 kg-ha/yr on Coyote Ridge.

While the contribution of nitrogen from MEC operation alone is relatively low, cumulative values (9.9 to 11.4 kg-ha/yr) approach or exceed the high range of nitrogen deposition (10 kg/ha-yr) considered sufficient to affect ecosystem structure and diversity. Any incremental increase in nitrogen deposition to an already stressed ecosystem would be significant. Therefore, impacts to federally threatened bay checkerspot butterfly and the federal species of concern Opler's longhorn moth from the elimination of essential host plant species from MEC operations are significant. In addition, nitrogen emissions would similarly impact the Metcalf canyon jewel flower, a federally endangered serpentine endemic plant species that occurs on Coyote Ridge.

Nitrogen emissions to Coyote Creek and Fisher Creek will occur due to direct deposition, ground water discharge and runoff input (Brocard 2000, see **Water Resources** section, Appendix D). Direct deposition would be negligible, about 10^{-6} mg/l. Groundwater discharge (0.2 mg/l) and runoff input (0.2mg/l) to Fisher Creek will result in an increase of about 0.4 mg/l (Brocard 2000). Similarly, runoff input into Coyote Creek would be about 0.2 mg/l (Brocard 2000). Current dissolved inorganic nitrate values for Coyote Creek are 0.7 mg/l (Calpine/Bechtel 2000f). This value is not known for Fisher Creek. Nitrate is not significantly toxic to fish and invertebrates (Russo 1985). Acute toxicity values for nitrate to chinook salmon, rainbow trout, and channel catfish are 1,310, 1,360, and 1,400 mg/l, respectively (Russo 1985). Nitrogen saturation of a forest is determined by the balance between the inputs (e.g. deposition) and the nitrogen retention capacity of ecosystem (Fenn et al. 1998). The riparian habitat along the creeks would not be as sensitive to nitrogen deposition as the serpentine habitat. In fact, riparian ecotones can be highly effective in removing nitrogen. The first 16 - 100 feet of riparian forests that are transitional between wetland and upland habitat can be particularly effective and strategies to reduce nitrogen to surface waters include maintaining riparian buffer strips (Fenn et al. 1998). Therefore, nitrogen additions to riparian habitat and Fisher and Coyote Creeks will are not expected to result in significant adverse impacts.

Smallwood (2000) expressed concern that salinity levels in the creeks from total dissolved solids (TDS) emissions from the cooling towers could threaten red-legged frogs. Red-legged frog eggs and larvae die when exposed to salinity levels greater than 4.5 and 7.0 parts per thousand (ppt). Fresh water creeks usually have salinity values below 0.15 ppt (Wetzel 1975). Annual PM₁₀ emissions from the cooling tower will be 1.81 lbs/hr. Using low flow in Coyote Creek during summer months of 15 cfs, and making the conservative estimate that all the TDS emissions (1.81 lbs/hr) would fall on Coyote Creek, the incremental annual increase in salinity would

be 4.46×10^{-3} ppt. This is well below the threshold known to cause harm to red-legged frog eggs or larvae.

MEC will use an average of 10.1 acre-feet/day (AF/day) and peak of 14.4 AF/day (3.3 to 4.7 million gallons per day) of water for cooling tower demands (Calpine/Bechtel 2000e). Water for cooling tower demands will be recycled water supplied by the South Bay Water Recycling (SBWR) Program. Potable water will be met from local groundwater from one of two suppliers; San Jose MUNI or the Great Oaks Water Company. During periodic planned and potential unplanned interruptions in recycled water supply, MEC would use ground water for cooling water demands. Planned interruptions are expected to be two to three times a year for up to 72 hours each. Calpine/Bechtel (2000e) prepared a groundwater budget to analyze, among other things, the use of groundwater on Coyote and Fisher Creeks. To account for interruptions in recycled water supply from SBWR, the water budget assumed five 72-hr interruptions for maintenance and one 30-day unplanned interruption would occur each year. The unplanned interruption was simulated to account for events such as the shut down during the 1997 floods. The water budget also included a cumulative analysis from projected water use from the Coyote Valley Research Park (CVRP) development. This report was supplemented by responses to data requests (Calpine/Bechtel 2000fg) and an Energy Commission staff analysis (Brocard 2000).

The result of these analyses found that ground water use by CVRP and/or MEC would reduce flows in both Fisher Creek and Coyote Creek by directly drawing water out of the creek or reducing groundwater discharge to the creek. Coyote Creek is a losing creek; it is not feed by groundwater, but loses water through seepage. Flows in Coyote Creek are diverted to the Coyote Canal. During the summer months, about 15 cfs remains in the creek from one mile north of Anderson Reservoir to three-quarters of a mile south of Fisher Creek. Fisher Creek is a gaining creek as it is fed directly by groundwater as well as precipitation. In drought years, Fisher Creek may be dry in summer months and during extended drought has been dry for several consecutive months. Continuous groundwater pumping by MEC alone would have a negligible impact to both creeks (220 AF/yr or 0.3cfs). During drought conditions, this could lengthen the time that Fisher Creek is dry. This reduction in flow is not significant for Coyote Creek. During continuous groundwater pumping by both MEC and CVRP without interruptions to recycled water supplies, Coyote Creek would experience an increase in seepage by 8%, reducing flows by 1,185 AF/yr. Fisher Creek's gain from recharge would decrease by 29% or 1,186 AF/yr. During the wet season, these reductions would be insignificant. During the dry seasons, Fisher Creek would be dry for longer periods. Groundwater pumping during 30-day unplanned interruptions in recycled water supply would occur during exceptionally wet periods and little impacts to the creek would be anticipated.

Fisher Creek does not support special status fisheries. Red-legged frogs may use Fisher Creek as a dispersal corridor. High water flows during winter in Coyote Creek allow chinook salmon and steelhead to migrate to the base of Anderson Dam to spawn. Coyote Creek flows are managed by releases from the dam. SCVWD plans to manage the creek for special status species including salmon, steelhead and red-legged frogs. Management may include maintaining a cold water reach in Coyote

Creek for juvenile salmon rearing habitat and removal of migration obstructions, and fish screens. SCVWD has stated that the effects of ground water pumping to Coyote and Fisher Creeks are small and can be managed by the District (Meinar 2000). Therefore, it is anticipated that reductions in flows to Coyote Creek would be mitigated by increased releases from Anderson Dam. The seepage from Coyote Creek would help recharge the ground water and provide recharge to Fisher Creek. However, if both MEC and CVRP are developed, there will be times when Fisher Creek is dry for an extended length of time. Because this is not considered an important creek to special status species, the impact is not considered significant.

CUMULATIVE IMPACTS

The California Environmental Quality Act (CEQA) defines cumulative impacts as “two or more individual effects which, when considered together, are considerable or which compound or increase other environmental impacts.” Future proposed development in the Santa Clara Valley includes the Coyote Valley Research Park (Cisco Systems Project; CVRP) and a Coyote Valley urban reserve development involving 25,000 dwellings on 170 acres (CVUR).

Automobile use and emissions will greatly increase in the valley as a result of these developments. It is anticipated that the proposed Cisco Systems development will result in 20,000 employees and potentially more vehicles during commuter hours (see **Air Quality** section). Estimated nitrogen emissions from CVRP and CVUR are 17.1 and 83.6 tons per year. Estimated nitrogen emissions from MEC are 37.7 tons per year from NO_x and 135 tons per year from ammonia (Calpine/Bechtel 2000j; Table BR1-1). Maps of cumulative nitrogen deposition show areas of greatest concentration near the urban reserve.

Ambient nitrogen deposition and cumulative deposition from ambient and projected increases from MEC exceed the threshold considered significant to alter plant composition and threatens local serpentine endemics. Consequently, cumulative impacts from the additional proposed developments to serpentine endemics from nitrogen deposition will be significant.

MITIGATION

CALPINE/BECHTEL PROPOSED MITIGATION MEASURES

Calpine/Bechtel has proposed the following mitigation measures to reduce potential impacts to biological resources.

GENERAL MITIGATION MEASURES

- Provide worker environmental awareness training.
- Provide construction monitoring by a qualified Designated Biologist.
- Prepare a Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) that details how mitigation measures will be implemented.
- Set-up exclusion zones to avoid sensitive habitats and species during construction.

- Construct silt fencing to avoid run off into Fisher Creek.
- Prohibit pesticide and herbicide use in project areas, except for a 10-foot wide area surrounding the facility boundary fenceline.
- Conduct preconstruction surveys for sensitive species.
- Prepare monthly and/or annual monitoring and compliance reports that analyze the effectiveness of mitigation measures.

FISHER CREEK MITIGATION MEASURES

The following proposed mitigation measures were provided in the *Riparian Corridor Biotic Assessment and Tree Removal Plan* (Calpine/Bechtel 2000b):

- Implement a 100-foot setback buffer zone from the Fisher Creek corridor.
- Conduct pre-construction surveys along Fisher Creek for California red-legged frog, western pond turtle, foothill yellow-legged frog, and California tiger salamander. Relocate any individuals found during surveys to areas approved by CDFG and USFWS.
- Plant a total of 320 native trees and enhance Fisher Creek riparian corridor.
- Install permanent fencing to prevent cattle access to Fisher Creek and tree planting areas.
- Implement erosion control measures, including Best Management Practices, during construction of the stormwater discharge pipe in accordance with a CDFG Streambed Alteration Agreement.
- Remove debris from Fisher Creek.
- Protect existing riparian vegetation before and after construction.
- Restore the spring and wetland to a natural state by removing water collection pipes and excluding cattle.

ORDINANCE TREES

The following proposed measures were provided in the *Tree Mitigation Planting Plan* (Calpine/Bechtel 2000b; Appendix A) to mitigate the removal of Santa Clara County and City of San Jose Ordinance sized trees.

- Trees more than 18 inches DBH replaced at a ratio of 4:1 using 24-inch box trees.
- Trees 12 to 18 inches DBH replaced at a ratio of 2:1 using 24-inch box trees.
- Trees less than 12 inches DBH replaced at a ratio of 1:1 using 15-gallon trees.
- Black Walnuts would be replaced by Valley oak, buckeye, sycamore, and coast live oak.
- English walnuts would be replaced by Valley oak.
- Coffeeberry would replace almond, olive, and fruit trees.
- To account for mortality losses of replacement trees, the total number of trees planted will be increased by 25% (for a total of 320 replacement trees).
- Three planting areas will be located along the riparian corridor. A forth planting area will be located within a visual screen landscape corridor along the southern end of the MEC site.
- Shrubs planted on the site will include elderberry, coyote brush, and mule fat.

- Maintenance of the mitigation plants would occur for a period of at least two years.
- Monitoring and, if necessary, remedial planting, would occur for at least 3 to 5 years.

TULARE HILL MITIGATION MEASURES- TRANSMISSION LINES

Mitigation proposed below, provided in Calpine/Bechtel's Biological Assessment (Calpine/Bechtel 2000d), will be implemented during construction of the new 240-foot transmission line. These were adopted from PG&E's *Low Effect -Habitat Conservation Plan for the Bay Checkerspot Butterfly for the Metcalf-Edenvale 115 kV Reconductor and Metcalf-Monta Vista 230 kV 4th Circuit Transmission Lines, Santa Clara County, California* (PG&E 1998).

- Set up temporary construction zone limits using wooden stakes and flagging tape to delimit work areas.
- Limit equipment and workers to construction zones.
- Restrict construction activities as much as possible to late summer/early fall months (June through September) to avoid impacting breeding adult bay checkerspot butterflies and Opler's longhorn moth.
- Use appropriate erosion control measures during wet weather months to prevent damage to serpentine habitat.
- Implement fire protection measures during construction.
- Use protective construction material in the impact zone to minimize soil compaction and damage to vegetation.
- Use protective material or water spray during construction to reduce dust and to protect dormant butterfly and moth larvae.
- Conduct post construction surveys to determine damage to annual host plant species and implement a restoration planting if necessary.
- Provide a monitoring report with pre- and post-construction photographs to document impacts and, if necessary, planting results.
- Conduct an avian collision monitoring program.

SERPENTINE HABITATS

Weiss (1999) determined well-managed cattle grazing to be essential toward maintaining serpentine endemics threatened by excessive nitrogen deposition. Cattle select the grasses over forbs, which helps prevent the non-native grasses from overcrowding the native annuals. In areas where cattle were removed, the serpentine endemics, including the bay checkerspot butterfly, disappeared. Conversely, butterflies returned to an area where they were formerly extirpated after cattle were reintroduced.

Tulare Hill is 339 acres. The parcel Calpine/Bechtel controls via a sale/purchase option agreement with Tulare Hill Corporation includes 116 acres of Tulare Hill. The remaining acres are owned by PG&E (45 acres), Tulare Hills Corporation (37 acres), and a private land owner (141 acres). To reduce impacts to serpentine endemics on Tulare Hill, Calpine/Bechtel proposed to manage the 116-acre portion of Tulare Hill under its control (Calpine/Bechtel 1999f) for thirty years. The hill is currently grazed at one cow per three acres and Calpine/Bechtel would change that

regime to one cow per 10 acres. This guideline is being used at nearby Kirby Canyon under a Conservation Agreement with USFWS to perpetuate serpentine habitats. Calpine/Bechtel do not intend to fence the 116-acre portion and will only maintain responsibility for managing that area under their control. Therefore, this management scheme could be hampered if other land owners graze at greater intensity or decide to change the land use entirely.

At an Energy Commission workshop on Biological Resource issues of the MEC project (February 2000), Dr. Weiss of the Center for Conservation Biology stated that management of Tulare Hill alone would not secure the bay checkerspot population. Impacts from nitrogen emissions on Coyote Ridge presented a much greater problem due to the high sensitivity of this area to the long-term survival of the bay checkerspot butterfly. Coyote Ridge is the core or source population for the area. Tulare Hill only supports intermittent populations of the butterfly and is dependent on the health of populations on Coyote Ridge. The last confirmed sighting of bay checkerspot butterfly on Tulare Hill was in 1995. Therefore, it was determined that measures proposed to mitigate indirect and cumulative impacts to serpentine habitats from increased nitrogen deposition to an already stressed ecosystem would not reduce impacts to less than significant levels. Further, it was determined that compensation must include an endowment fund to manage and administer the lands in perpetuity rather than just 30 years.

As a result of this conclusion, Calpine/Bechtel proposed the following mitigation package.

- Acquire and manage cattle grazing on the 116-acre parcel of Tulare Hill and 15 acres on Coyote Ridge in perpetuity.
- Implement an adaptive management strategy that depends on habitat responses to cattle grazing on Tulare Hill.
- Incorporate a contingency plan for fencing if grazing by other landowners on Tulare Hill affected the grazing strategy.
- Provide an endowment fund to be determined by the Center for Natural Lands Management PAR analysis to manage and administer compensation lands in perpetuity.

Compensation values were determined using the applicant's formula, but inserting true deposition values rather than weighted averages. Deposition of 1.13 kg-ha/yr on Tulare Hill represents 13.5% of the ambient levels (8.4 kg-ha/yr). Multiplying 13.5% by the 339 acres on Tulare Hill that will be directly impacted yields 45.6 acres. Deposition of 0.13 kg-ha/yr on Coyote Ridge represents 1.55% of ambient. Multiplying 1.55% by the 2,328 acres on Coyote Ridge that will be directly impacted yields 36.08 acres.

Because staff believes that Tulare Hill is only marginal butterfly habitat, it stands to reason that the compensation ratio for mitigation should be reduced to 0.5:1. The core habitat at Coyote Ridge should be compensated at a ratio of 3:1. Therefore,

the applicant is responsible for providing 131 acres of mitigation ($[45.6 \times 0.5] + [36.05 \times 3]$).

The 15 acres of land on Coyote Ridge will be adjacent to lands managed by the Open Space Authority, which is currently managing the Kirby Canyon Trust lands for the benefit of serpentine endemics. Therefore, the compensation will contribute to a larger regional scale effort to preserve special status species. Portions of the area also support red-legged frogs. Upland habitat for red-legged frogs will also be provided by securing lands on Tulare Hill.

COMPLIANCE WITH APPLICABLE LORS

Calpine/Bechtel must obtain a federal Biological Opinion from the USFWS. The U.S. Environmental Protection Agency (EPA) has initiated formal consultation under section 7 of the Endangered Species Act with USFWS and the National Marine Fisheries Service and a biological opinion is expected in October. The applicant must apply for a Nationwide Permit 7 from U.S. Army Corps of Engineers for the stormwater outflow and will need a Streambed Alteration permit from CDFG and a NPDES permit from the State Water Quality Control Board. The applicant will also require City and County permits for the removal of up to 59 ordinance-sized trees. These permits are addressed in the Biological Resources Conditions of Certification and will be obtained at least a month prior to the start of construction activities. Finally, the applicant will need to enter into an Agreement with the County to secure permits and easement rights to drill the gas line under Coyote Creek. This is addressed under conditions of certification in the **Land Use** section (**Land-5**).

The City of San Jose has several policies that address development requirements in riparian areas (see LORS and Land Use). Two policies, a setback area from riparian corridors and retaining ambient noise levels in riparian policies, are not strictly adhered to by MEC design. The setback policy prohibits construction within 100 feet from a riparian corridor and MEC will require a temporary lay down area within the setback, but outside of the riparian corridor proper. This area is currently highly disturbed and will be restored after construction. The restoration will result in an additional 4.3 acres of riparian habitat. While operational noise levels of 60 dBA will exceed ambient levels by as much as 18 dBA during early morning hours (1:00 am to 4:00 a.m.), operational noise levels will not greatly exceed the mean ambient nighttime (10:00 p.m. to 7:00 a.m.) noise levels of 57 and 55 dBA or the mean ambient daytime level of 58 dBA. Noise levels from operation will not exceed levels that can result in adverse effects on animal hearing or other physiological functions (80 dB). Noise during construction will cause a temporary impact to wildlife; however, current wildlife use of the area is low. Staff assumes these policies were adopted by the City to benefit natural areas and wildlife. However, staff has concluded that the ultimate increase in riparian habitat and minor increase in ambient noise will not adversely affect biological resources.

FACILITY CLOSURE

Sometime in the future, the MEC will experience either a planned closure, or be unexpectedly (either temporarily or permanently) closed. When facility closure occurs, it must be done in such a way as to protect the environment and public health and safety. To address facility closure, an “on-site contingency plan” will be developed by the project owner, and approved by the Energy Commission Compliance Project Manager (CPM). Facility Closure mitigation measures will also be included in the Biological Resources Mitigation Implementation and Monitoring Plan prepared by the applicant

The area required for the power plant and water pipelines are in disturbed or developed habitats. The natural gas pipeline will be in agricultural lands, along existing roads, or will be horizontally directional drilled under Coyote Creek. The facility closure plan needs to address habitat restoration measures to be implemented in the event of a planned or an unexpected permanent closure. Habitat restoration measures that should be addressed include such tasks as the removal of all structures and the immediate implementation of habitat restoration measures to establish native plant species and native habitat. Because 116 acres of Tulare Hill serpentine habitat are included in the parcel Calpine/Bechtel will purchase, the plan should address long-term preservation of Tulare Hill. In addition, planned or unexpected permanent facility closure may also trigger the removal of the transmission conductors.

Staff does not have any biological resource facility closure recommendations in the event of an unexpected temporary closure of the MEC. However, in the event that the Energy Commission CPM decides that the facility is permanently closed, the facility closure measures provided in the on-site contingency plan and Biological Resources Mitigation Implementation and Monitoring Plan would need to be implemented.

RESPONSE TO PUBLIC AND AGENCY COMMENTS

DEPARTMENT OF PLANNING, CITY OF SAN JOSE

SJ-6

The Biological Resources section does not address whether the project is in compliance with LORS. See Compliance with Applicable Laws, Ordinances, Regulations and Standards. This section has been revised and concludes that the project would comply with appropriate LORS.

*More discussion is needed on the effect of noise and lighting on biological resources adjacent to Fisher Creek. Guideline 2F of the Riparian Corridor Policy should be included in LORS. See Indirect Impacts, this discussion has been revised. Guideline 2F of the Riparian Corridor Policy has been added to LORS. Lighting restrictions are identified in **VIS-3**, in the Visual Resources section. This condition prohibits lighting from trespassing into the riparian corridor.*

The designation of a 75-foot wide construction area and use of pesticides to clear a ten-foot wide area within the riparian corridor is not supported. The project should condition that herbicides used are only those labeled for use adjacent to water courses. See discussion under Direct Impacts and Compliance with LORS. The temporary construction area will not be in the riparian corridor, but will be in the 100-foot setback area from the riparian corridor. The area is heavily disturbed and will be restored to a condition that will result in an additional 4.3 acres of riparian habitat. Therefore, from a biological resources perspective, no adverse impacts are associated with the temporary lay down area. Pesticides will not be used. Herbicides used will only be those designated safe to aquatic and non-aquatic wildlife. If the City has a preferred list of specific herbicides, staff would request that only these be used in the 10-ft wide area surrounding the fence line. The list of herbicides that can be used will be listed in the Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP).

Include an analysis of using SCONOX instead of SCR as the emission control system. SCR controls thermal and fuel emissions by reducing NOx with a reagent, in this case, ammonia. Use of SCONOX would eliminate the ammonia emission, which for MEC is 118 tons per year. The ISCST3 model used to determine nitrogen deposition rates assumes that all the NOx and ammonia will be in the form of depositional nitrogen (nitrate and ammonium ions) at the moment they leave the HRSG stacks. In reality, this reaction requires sunlight, ozone, and time and nitrogen deposition would occur more gradually over a greater area. Nonetheless, the model provides a worse case scenario that staff has used to determine necessary mitigation. If SCONOX were used, we would require the nitrogen deposition model be re-run to reflect this change and determine mitigation. However, staff believes that the compensatory mitigation discussed under Mitigation would reduce the impacts to serpentine soils from nitrogen deposition from the SCR system to less than significant levels.

Verification:

PARKS AND RECREATION, COUNTY OF SANTA CLARA

SC-3

The County requires the applicant to enter into an agreement to ensure that all necessary licenses and easement rights for construction and maintenance of the natural gas line are secured. See discussions under Setting, Natural Gas Pipeline and Compliance with Applicable LORS. The County requires a 150-ft setback from Coyote Creek and the applicant has stated that a 500-ft setback will be incorporated. In addition, the applicant will be required to avoid all sensitive areas (e.g. wetlands and riparian vegetation) and the storm water canal that serves as a wildlife corridor and water conveyance. These avoidance measures will be spelled out in the Biological Resource Mitigation Implementation and Monitoring Plan (BRMIMP). A copy of the draft BRMIMP will be forwarded to the County for review in October 2000. The Agreement with the County will be required under Conditions of Certification **LAND-5**, under the **Land Use** Section of this FSA.

SC-4

The PSA is incomplete because studies to explore potential negative effects of project emissions have not included impact to riparian habitat and sensitive species found along Coyote Creek. Furthermore, any measures proposed to mitigate impacts of nitrogen deposition in the environment should include measures to mitigate their impacts on Coyote and Fisher Creeks. See discussion under Indirect Impacts, Fisher and Coyote Creek. Project emissions to Coyote and Fisher Creeks will be negligible. Therefore, no mitigation measures will be required.

SANTA CLARA VALLEY CHAPTER, CALIFORNIA NATIVE PLANT SOCIETY, LIBBY LUCAS

NPS-3

Are the 80 trees that will be lost in the historic riparian corridor? Can a serious act of preservation of these trees be addressed in the biological assessment? Is the Santa Clara County 150-foot riparian setback applied to Fisher Creek? What wildlife depend on the trees and agriculture that will be removed? See discussions under Direct Impacts and Indirect impacts. Eleven of the 80 trees are within the 100-ft riparian corridor setback area, but none are within the riparian corridor proper. The row of walnut trees that border the southern end of site were probably planted and are not considered part of the riparian corridor. Historically, the alignment of Fisher Creek was roughly along what is now Blanchard Road. The section of the creek that borders the MEC site was excavated in the late 1800's. The eleven trees will be replaced by 320 trees. Santa Clara County's 150-ft setback from riparian corridors applies to parklands, such as those bordering Coyote Creek, and not Fisher Creek. Current use of Fisher Creek and adjacent agricultural field is low and consists of common songbirds, California ground squirrels, and other common and widespread species. No special-status species were found in these areas. No direct impacts to wildlife would occur from construction. Indirect impacts would include a temporary reduction in foraging and potential nesting habitat.

NPS-4

Will direct impacts from noise and cooling tower exhaust deter butterflies and other wildlife from using Tulare Hill? Biological review is needed to determine if bats or migratory birds are adversely affected. Will field surveys conducted over a one-year period be sufficient for a reliable base data? Drought periods should be considered in evaluation of serpentine grasslands or for presence of red-legged frogs. See discussions under Direct Impacts and Indirect Impacts. Operational noise will be lower than levels known to adversely affect wildlife. It is not anticipated that cooling tower exhaust will deter wildlife from using Tulare Hill as the prevailing winds are away from the hill. Nitrogen deposition from MEC will be highest on Tulare Hill; however, the hill will be managed in a manner that promotes the host species of the bay checkerspot butterfly. The evaluation of biological resources, including bats and migratory birds, identifies species that were found or that could occur on the site. Wildlife use in the area is currently low and efforts to restore and add 4.3 acres of riparian habitat will benefit wildlife in the long-term. While field surveys conducted over several years would provide a better baseline data base, it is not feasible to require the applicant to do this unless there are special circumstances that require long-term surveys (e.g. population analysis). The surveys conducted were done so at the appropriate times of the year (e.g. blooming periods, nesting periods) and

over a time frame that is widely accepted by resource agencies. Drought years were used to analyze the effects of groundwater use on Fisher and Coyote Creeks and it was determined that effects would be negligible. The effects of drought on serpentine grasslands were not evaluated because management of serpentine grasslands will be adjusted to account for growth during drought years.

NPS-5

Biological review must include fish. Any drains or stormwater runoff to Fisher Creek should be engineered to avoid temperature or pollutant spikes. See discussion on Fisher and Coyote Creek. Special status and recreational fish species use Coyote Creek but Fisher Creek, which can be dry during summer months, has limited value for these species. Stormwater run off would only occur during the wet season when flows are higher. Coyote Creek flows will not be adversely affected by the project. Santa Clara Valley Water District manages Coyote Creek and is currently developing a management plan for special status species including chinook salmon, steelhead, and Sacramento sucker. The Water District has stated that operation of MEC will not result in management problems. A stormwater discharge permit will be required and will prohibit discharges that would cause aquatic degradation.

NPS-6

All the revegetation that is on the padded up site will be slower to grow into viable habitat as the roots will not be in the high water table of the present riparian habitat. No trees will be planted on the elevated pad. The high ground water table extends into the 100-ft setback where new trees will be planted.

NPS-7

A Habitat Conservation Plan should be prepared for Tulare Hill and include a five-year monitoring plan. A contingency plan should include compensation of lands on Coyote Ridge. Compensation lands will be purchased on both Tulare Hill and Coyote Ridge. A management plan approved by species experts and U.S. Fish and Wildlife Service is required. The management plan will include a long-term monitoring component that will help determine appropriate long-term management schemes for the benefit of serpentine endemics. Preservation and management of compensation lands on Tulare Hill and Coyote Ridge will be in perpetuity.

NPS-8

A Habitat Conservation Plan should be developed for the recreation trail along Fisher Creek. The Plan should consider visual, noise, health and safety impacts. Plans for a trail are conceptual. If a trail is built along Fisher Creek, the City of San Jose would be required to prepare an environmental assessment.

NPS-11

There is concern about the validity of the nitrogen deposition analysis on serpentine habitats and no analysis of nitrogen deposition on the water resources. The nitrogen deposition analysis was revised to better reflect current conditions surrounding the MEC site. Staff believes that the analysis correctly reflects impacts to serpentine soils and that the project will be mitigated to improve habitat for the serpentine endemics and reduce these impacts to less than significant levels. An

analysis of nitrogen deposition to water is included under Indirect Impacts, Fisher and Coyote Creek and in the **Water Resources** Section. Nitrogen deposition on creeks will be negligible.

NPS-12

Would nitrogen loading and resultant increase in grass growth increase fire danger on Coyote Ridge and the Santa Teresa Hills? Is this a concern to County Parks and Department of Fish and Game? Increasing grass growth could increase the potential for fire if lands are not properly managed. County Parks and Fish and Game have not expressed concern over this matter.

TEWFIK MOURAD

TM-3

The effect on streams has not been adequately addressed. See discussion under Indirect Impacts, Fish and Coyote Creeks. The MEC project will not result in significant impacts to creeks.

CONCLUSIONS AND RECOMMENDATIONS

The MEC project has the potential to result in significant adverse effects, both indirectly and cumulatively, to serpentine soils and associated federally listed species. Staff concurs that mitigation proposed by the applicant for direct impacts to Fisher Creek, Ordinance trees, and construction of the transmission line on Tulare Hill are sufficient to reduce impacts to less than significant levels. In fact, the Fisher Creek enhancement plan would greatly increase the size and value of the existing riparian habitat. Staff further concludes that the proposed compensation package to purchase and manage habitat on Coyote Ridge and Tulare Hill will fully mitigate indirect and cumulative impacts from the MEC project to serpentine habitats and associated species and potential impacts to red-legged frogs.

Staff recommends approval of the project provided that the following Conditions of Certification are adopted.

CONDITIONS OF CERTIFICATION

DESIGNATED BIOLOGIST

BIO-1 Construction site and/or ancillary facilities preparation (described as any ground disturbing activity other than Energy Commission approved geotechnical work) shall not begin until an Energy Commission Compliance Project Manager (CPM) approved Designated Biologist is available to be on site.

The Designated Biologist must meet the following minimum qualifications:

- A Bachelor's Degree in biological sciences, zoology, botany, ecology, or a closely related field and three years of experience in field biology;

- One year of field experience with biological resources found in or near the project area; and
- An ability to demonstrate to the satisfaction of the CPM the appropriate education and experience for the biological resources tasks that must be addressed during project construction and operation.

Verification: If the CPM determines the proposed Designated Biologist to be unacceptable, the project owner shall submit another individual's name and qualifications for consideration. If the approved Designated Biologist needs to be replaced, the project owner shall obtain approval of a new Designated Biologist by submitting to the CPM the name, qualifications, address, and telephone number of the proposed replacement. No disturbance will be allowed in any designated sensitive areas until the CPM approves a new Designated Biologist and the new biologist is on site.

At least 60 days prior to the start of any ground disturbance activities, the project owner shall submit to the CPM for approval, the name, qualifications, address and telephone number of the individual selected by the project owner as the Designated Biologist. If a Designated Biologist is replaced, the information on the proposed replacement, as specified in the condition, must be submitted in writing at least ten working days prior to the termination or release of the preceding Designated Biologist.

BIO-2 The CPM approved Designated Biologist shall perform the following during project construction and operation:

- Advise the project owner's Construction Manager on the implementation of the Biological Resource Conditions of Certification;
- Supervise or conduct mitigation, monitoring and other biological resources compliance efforts, particularly in areas requiring avoidance or containing sensitive biological resources, such as, wetlands and special status species; and
- Notify the project owner and the CPM of any non-compliance with any Biological Resources Condition of Certification.

Verification: During project construction, the Designated Biologist shall maintain written records of the tasks described above, and summaries of these records shall be submitted along with the Monthly Compliance Reports to the CPM. During project operation, the Designated Biologist shall submit record summaries in the Annual Compliance Report.

BIO-3 The project owner's Construction Manager shall act on the advice of the Designated Biologist to ensure conformance with the Biological Resources Conditions of Certification.

The project owner's Construction Manager shall halt, if necessary, all construction activities in areas specifically identified by the Designated

Biologist as sensitive to assure that potential significant biological resource impacts are avoided.

The Designated Biologist shall:

- Inform the project owner and the Construction Manager when to resume construction, and
- Advise the CPM if any corrective actions are needed or have been instituted.

Verification: Within two (2) working days of a Designated Biologist notification of non-compliance with a Biological Resources condition of certification or a halt of construction, the project owner shall notify the CPM by telephone of the circumstances and actions being taken to resolve the problem or the non-compliance with a condition. For any necessary corrective action taken by the project owner, a determination of success or failure will be made by the CPM within five (5) working days after receipt of notice that corrective action is completed, or the project owner will be notified by the CPM that coordination with other agencies will require additional time before a determination can be made.

BIOLOGICAL RESOURCES MITIGATION IMPLEMENTATION & MONITORING PLAN

BIO-4 The project owner shall submit to the CPM for review and approval a copy of the final Biological Resources Mitigation Implementation and Monitoring Plan (BRMIMP) and, once approved, shall implement the measures identified in the plan.

Protocol: The final BRMIMP shall identify:

- All Biological Resource Conditions included in the Commission's Final Decision;
- All mitigation measures identified by Calpine/Bechtel and listed under Mitigation, Calpine/Bechtel's Proposed Mitigation Measures in the Biological Resources FSA;
- A list and a map of locations of all sensitive biological resources to be impacted, avoided, or mitigated by project construction and operation;
- A list of all terms and conditions of the USFWS Biological Opinion, the USACE 404 Permits and the Santa Clara County's Agreement;
- A detailed description of measures, Best Management Practices, and take avoidance measures that will be implemented to avoid and/or minimize impacts to sensitive species and reduce habitat disturbance;
- All locations, on a map of suitable scale, of laydown areas and areas requiring temporary protection and avoidance during construction;
- Aerial photographs (scale 1:200) of all areas to be disturbed during project construction activities - one set prior to site disturbance and one set after project construction. Include planned timing of aerial photography and a description of why times were chosen;

- Duration for each type of monitoring and a description of monitoring methodologies and frequency;
- Performance standards to be used to help decide if/when proposed mitigation is or is not successful;
- All performance standards and remedial measures to be implemented if performance standards are not met;
- A discussion of biological resource-related facility closure measures; and
- A process for proposing plan modifications to the CPM and appropriate agencies for review and approval.

Verification: At least 45 days prior to start of any project-related ground disturbance activities, the project owner shall provide the CPM with the final version of the BRMIMP for this project, and the CPM will determine the plans acceptability. The project owner shall notify the CPM five (5) working days before implementing any CPM approved modifications to the BRMIMP.

Within 30 days after completion of project construction, the project owner shall provide to the CPM for review and approval, a written report identifying which items of the BRMIMP have been completed, a summary of all modifications to mitigation measures made during the project's construction phase, and which mitigation and monitoring plan items are still outstanding.

RIPARIAN RESTORATION

BIO-5 Prior to the start of any ground disturbance activities, the project owner shall develop the riparian corridor planting plan for inclusion into the Biological Resources Mitigation Implementation and Monitoring Plan. The protocol shall include a thorough discussion of methods, species, and location for plantings, erosion control, criteria for success, a monitoring program, and a reporting requirement. The plan should include an inclusive list of herbicides and application procedures that will be used within the 10-ft area surrounding the fence line. If the CPM determines that the plan requires modification, the project owner shall modify the report based on the CPM's comments.

Verification: At least 45 days prior to the start of any ground disturbance activities, the project owner shall provide to the CPM for review and approval the above riparian restoration plan.

WORKER ENVIRONMENTAL AWARENESS PROGRAM

BIO-6 The project owner shall develop and implement a CPM approved Worker Environmental Awareness Program in which each of its employees, as well as employees of contractors and subcontractors who work on the project site or related facilities during construction and operation, are informed about sensitive biological resources associated with the project.

Protocol: The Worker Environmental Awareness Program must:

- Be developed by the Designated Biologist and consist of an on-site or training center presentation in which supporting written material is made available to all participants;
- Discuss the locations and types of sensitive biological resources on the project site and adjacent areas;
- Present the reasons for protecting these resources;
- Present the meaning of various temporary and permanent habitat protection measures; and
- Identify whom to contact if there are further comments and questions about the material discussed in the program.

The specific program can be administered by a competent individual(s) acceptable to the Designated Biologist.

Each participant in the on-site Worker Environmental Awareness Program shall sign a statement declaring that the individual understands and shall abide by the guidelines set forth in the program materials. The person administering the program shall also sign each statement.

Verification: At least 60 days prior to the start of rough grading, the project owner shall provide copies of the Worker Environmental Awareness Program and all supporting written materials prepared by the Designated Biologist and the name and qualifications of the person(s) administering the program to the CPM for approval. The project owner shall state in the Monthly Compliance Report the number of persons who have completed the training in the prior month and a keep record all persons who have completed the training to date. The signed statements for the construction phase shall be kept on file by the project owner and made available for examination by the CPM for a period of at least six months after the start of commercial operation. During project operation, signed statements for active project operational personnel shall be kept on file for the duration of their employment and for six months after their termination.

CALIFORNIA DEPARTMENT OF FISH & GAME PERMITS

BIO-7 Prior to start of any streambed disturbance activities, the project owner shall acquire a Streambed Alteration Agreement from CDFG in accordance with Section 1603 of the California Fish and Game Code and implement the permit terms and conditions.

Verification: No less than fifteen days prior to the start of any project related ground disturbance activities, the project owner shall submit to the CPM a copy of the final CDFG Streambed Alteration Agreement. Agreement terms and conditions will be incorporated into the Biological Resources Mitigation Implementation and Monitoring Plan.

U. S. FISH & WILDLIFE SERVICE SECTION 7 BIOLOGICAL OPINION

BIO-8 Prior to the start of any ground disturbance activities, the project owner shall provide a final copy of the U.S. Fish and Wildlife Service Biological Opinion in accordance with Section 7 of the federal Endangered Species Act and

incorporate the terms of the biological opinion into the Biological Resources Mitigation Implementation and Monitoring Plan. The project owner will implement the terms and conditions contained in the Biological Opinion.

Verification: At least 45 days prior to the start of any project related ground disturbance activities, the project owner shall submit to the CPM a copy of the USFWS Biological Opinion. Permit terms and conditions will be incorporated into the Biological Resources Mitigation Implementation and Monitoring Plan.

U.S ARMY CORPS OF ENGINEERS PERMIT

BIO-9 Prior to the start of any ground disturbance activities, the project owner shall provide a final copy of the Nationwide No.7 permit in accordance with Section 404 of the Clean Water Act. The project owner will implement the terms and conditions contained in the permit.

Verification: At least 30 days prior to the start of any project related ground disturbance activities, the project owner shall submit to the CPM a copy of the Nationwide No. 7 permit. Permit terms and conditions will be incorporated into the Biological Resources Mitigation Implementation and Monitoring Plan.

HABITAT COMPENSATION

BIO-10 To compensate for impacts to serpentine soils and associated endemic species, the project owner shall provide 116 acres of land on Tulare Hill and 15 acres of land on Coyote Ridge, the name of the entity that will be managing the land in perpetuity, and the endowment funds in the amount determined suitable from the Center for Natural Lands PAR analysis to administer and manage in perpetuity. Each of these must have been pre-approved by Energy Commission staff and USFWS.

Verification: Within one week of project certification, the project owner must provide to the CPM for approval, the name of the management entity, written verification that the compensation lands have been purchased and written verification that the appropriate endowment fund (determined by the PAR analysis) has been received by the approved management entity.

BIO-11 The applicant, in consultation with the USFWS and Energy Commission staff, will develop a suitable final habitat management and monitoring plan for lands purchased on Tulare Hill (116 acres) and Coyote Ridge (15 acres).

Verification: At least 60 days prior to the start of any project-related ground disturbance activities, the project owner shall provide the CPM with the final approved version of the management plan. Once the plan is approved, it shall be incorporated into the BRMIMP.

FACILITY CLOSURE

BIO-12 The project owner will incorporate into the planned permanent or unexpected permanent closure plan measures that address the local biological resources. The biological resource facility closure measures will also be incorporated into the project BRMIMP.

Verification: At least 12 months (or a mutually agreed upon time) prior to the commencement of closure activities, the project owner shall address all biological resource-related issues associated with facility closure in a Biological Resources Element. The Biological Resources Element will be incorporated into the Facility Closure Plan, and include a complete discussion of the local biological resources and proposed facility closure mitigation measures.

SITE PREPARATION

BIO-13 Prior to initial project site mobilization (i.e., placing a trailer on site with accompanying equipment, utilities, and grading) the project owner must comply with Bio-1, Bio-2, and Bio-10 and complete Bio-6 as it pertains to management, supervisors, and workers involved in this undertaking. Prior to the initial site mobilization, the designated biologist shall examine the area and ensure no special status species are present.

Verification: At least 10 days prior to engaging in the initial project site mobilization defined in this condition, the project owner shall provide the CPM with the location of the initial mobilization site, and the date(s), methods(s), and results of the pre-examination. The document will be reviewed and approved by the CPM.

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SOIL AND WATER RESOURCES

Testimony of Lorraine White, Dominique Brocard and Joseph O'Hagan

INTRODUCTION

This section of staff's Final Staff Assessment (FSA) analyzes potential effects on soil and water resources by the Metcalf Energy Center (MEC), specifically focusing on the potential for the project to induce erosion and sedimentation, adversely affect surface and groundwater supplies, and degrade surface and groundwater quality. Also addressed by staff in this analysis is the project's ability to comply with all applicable federal, state and local laws, ordinances, regulations and standards (LORS). Where the potential for impacts is identified, staff proposes mitigation measures to reduce the significance of the impact and, as appropriate, recommends conditions of certification.

Flooding and drainage issues are addressed in the **Geology and Paleontology** section of this document.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

FEDERAL

CLEAN WATER ACT

The Clean Water Act (33 Unified States Code §1257 et seq.) requires states to set standards to protect water quality. Point source discharges to surface water are regulated by this act through requirements set forth in specific or general National Pollutant Discharge Elimination System (NPDES) permits. Stormwater discharges during construction and operation of a facility and incidental non-stormwater discharges associated with transmission and pipeline construction also fall under this act and are addressed through a general NPDES permit. Section 307 and 403 of the Act (33 USC §§1317,1343), requires that all non-domestic discharges to wastewater treatment plants must receive a pretreatment permit. This permit is to ensure that the discharge will not interfere with the treatment processes at the plant or make the facility violate its own discharge permit limitations.

In California, Clean Water Act requirements are administered by the nine Regional Water Quality Control Boards (RWQCBs). Section 404 of the Act regulates the discharge of dredged or fill material into waters of the United States, including rivers, streams and wetlands. Site specific or general (Nationwide) permits for such discharges are issued by the Army Corp of Engineers (ACOE) and are certified by the RWQCBs.

STATE

PORTER-COLOGNE WATER QUALITY CONTROL ACT

The Porter-Cologne Water Quality Control Act of 1967, Water Code section 13000 et seq., requires the State Water Resources Control Board (SWRCB) and the nine RWQCBs to adopt water quality criteria to protect state waters. These criteria include the identification of beneficial uses, narrative and numerical water quality standards and implementation procedures. The criteria for the project area are contained in the San Francisco Bay Regional Water Quality Control Board's (SFBRWQCB) San Francisco Bay Basin Water Quality Control Plan (Basin Plan) (SFBRWQCB 1995b).

Under provisions of the Clean Water Act, the SWRCB adopted two general National Pollutant Discharge Elimination System (NPDES) permits for control of stormwater runoff during construction and operation of industrial facilities, such as a power plant and associated facilities.

Ground disturbance activities affecting greater than five acres are required, under the General Construction Activity Storm Water Permit, to prepare and implement a Storm Water Pollution Prevention Plan (SWPPP). This plan identifies best management practices to reduce sediment, oil and other contaminants in stormwater discharges from the site. The general NPDES permit for Industrial Activities also requires industrial facilities, such as power plants, to prepare and implement a SWPPP that identifies best management practices to reduce the discharge of contaminants from facility operation in stormwater discharge.

401 WATER QUALITY CERTIFICATION

Section 401 of the Clean Water Act provides for state certification that federal permits allowing discharge of dredged or fill material into waters of the United States will not violate federal and state water quality standards. A number of the proposed MEC facilities will be constructed in or near creeks that are considered waters of the United States. For the MEC, the SFBRWQCB will issue the 401 certification for this project.

STATE WATER RESOURCES CONTROL BOARD POLICY 75-58

The SWRCB has also adopted a number of policies that provide guidelines for water quality protection. The principle policy of the SWRCB which addresses the specific siting of energy facilities is the Water Quality Control Policy on the Use and Disposal of Inland Waters Used for Powerplant Cooling (adopted by SWRCB on June 19, 1975 by Resolution 75-58). This policy states that use of fresh inland waters should only be used for power plant cooling if other sources or other methods of cooling would be environmentally undesirable or economically unsound. This SWRCB policy states that power plant cooling water should, in order of priority, come from wastewater being discharged to the ocean, ocean water, brackish water from natural sources or irrigation return flow, inland waste waters of low total dissolved solids, and other inland waters. This policy goes on to address cooling water discharge prohibitions.

STATE WATER CODE SECTION 13550 ET SEQ.

Section 13551 of the Water Code prohibits the use of "...water from any source of quality suitable for potable domestic use for non-potable uses, including ...industrial... uses, if suitable recycled water is available..." given conditions set forth in section 13550. These conditions take into account the quality and cost of the water, the potential for public health impacts and the effects on downstream water rights, beneficial uses and biological resources.

Section 13552.6 of the Water Code states that the use of potable domestic water for cooling towers, if suitable recycled water is available, is an unreasonable use of water. The availability of recycled water is based upon a number of criteria, which must be taken into account by the SWRCB. These criteria are that: the quality and quantity of the reclaimed water are suitable for the use; the cost is reasonable; the use is not detrimental to public health, will not impact downstream users or biological resources and will not degrade water quality.

Section 13552.8 of the Water Code states that any public agency may require the use of recycled water in cooling towers if certain criteria are met. These criteria include that recycled water is available and meets the requirements set forth in section 13550; the use does not adversely affect any existing water right; and if there is public exposure to cooling tower mist using recycled water, appropriate mitigation or control is necessary.

LOCAL

SAN FRANCISCO REGIONAL WATER QUALITY CONTROL BOARD – establishes standards and requirements for the Recycled Water Use Permit issued by the South Bay Water Recycling Program; issues NPDES surface water discharge permits for construction and operation activities.

SANTA CLARA VALLEY WATER DISTRICT – controls surface water discharge; requires permits for well construction; responsible for countywide groundwater and flood management; is the regional water wholesaler; and requires a permit (District Ordinance 83-2) to perform specific activities within floodways or upon or within the banks of a watercourse.

SANTA CLARA COUNTY – establishes grading and stormwater pollution control requirements (Ordinance No. NS1203.35 and NS517.55) and implements the Santa Clara County Non-point Source Pollution Control Program (1993).

SOUTH BAY WATER RECYCLING PROGRAM - establishes requirements for planning, constructing and operating a recycled water system for both new and existing facilities. Wholesaler of recycled water and may set forth site-specific requirements in the Recycled Water Use Permit (Rules and Regulations, August 1996).

CITY OF SAN JOSE

- sets forth excavation and grading requirements.

- specifies that new development is expected to pay the capital costs for infrastructure required to support it (City of San Jose General Plan, Growth Management Strategy).
- establishes guidelines and development restrictions to protect water quality and riparian habitat (Riparian Corridor Policy Study, March 1999).
- specifies water quality objectives and states that no measurable degradation of groundwater quality will be permitted and that stormwater runoff will not add to the potential for downstream flooding (North Coyote Valley Campus Industrial Area Master Development Plan: Environmental Performance Standards).
- requires that stormwater drainage systems be designed to protect against the 100-year frequency storm (Design Guidelines for Storm Drains, April 1990).
- requires an Industrial Wastewater Discharge Permit on behalf of the Santa Clara/San Jose Water Pollution Control Plant for wastewater discharges to the San Jose Municipal sewer system regulating wastewater discharges and imposing limits (Ordinance No. 24800).

ENVIRONMENTAL SETTING

SITE DESCRIPTION

Calpine/Bechtel is proposing to locate the MEC on the southern base of Tulare Hill in South San Jose at the north edge of Coyote Valley. Coyote Valley is in the Santa Clara Valley that extends from the San Francisco Bay south to Hollister, bordered by the Diablo Range on the east and the Santa Cruz Mountains and the Gabilan Range on the west. Current site elevation is roughly 247 feet above mean sea level (msl).

The proposed power plant site and an adjacent construction laydown area will be constructed on prime agricultural land, the majority of which is in active cultivation. The remaining area is occupied by several structures, and is used for grazing and storage. After the completion of the MEC, it is expected that the construction laydown area will be returned to agricultural production.

Santa Clara Valley generally experiences dry summers with moderate to high temperatures and cool nights. Winters tend to be wet with moderate temperatures. Annual average rainfall is more than 14 inches (based on 121 years of recorded data with ranges from 4.8 to more than 30 inches) with more than 80 percent of the precipitation occurring between November and March (DWR 1980; SCVWD 1997). Average January rainfall is 2.78 inches while average June rainfall is only 0.05 inches (Calpine/Bechtel 2000, Data Response BR-155R). Calpine/Bechtel (2000f) estimated the 10-year, 24-hour duration storm will produce rainfall depths of 4.62 inches and the 100-year, 24-hour duration storm will produce rainfall depths of 6.89 inches of rain.

SOILS

Soils in the location of the project consist of sands, gravels and finer grained sediment that were deposited as alluvium by Coyote Creek, and to some degree its tributary, Fisher Creek. Predominate soil types in the alluvial fan deposits are Los Robles clay loam, Yolo silty clay loam and Sunnyvale silty clay. At the distal edges of the fan in the northern part of the Coyote Valley, finer-grained sediments are found overlain with clayey soils (Calpine/Bechtel 1999a, p. 8.14.1). This region of the Coyote Valley is referred to as the Laguna Seca and, prior to the installation of a drainage system, was subjected to periodic flooding.

Several soil mapping units will be encountered in the construction of this project, most derived from sedimentary alluvium and in excess of 5 feet to bedrock (Calpine/Bechtel 1999a, 2000b). At the proposed plant site, two soil mapping units are present. Approximately half of the site is Sunnyvale silty clay characterized as poorly drained clay that has a low permeability. Slopes for this soil mapping unit range from 0 to 2 percent and have an erosion hazard rating of "none to slight". The other half of the site is Yolo silty clay loam characterized as well-drained clay that has moderate permeability. This soil has slopes in the same range as the Sunnyvale soil and the same erosion hazard rating.

A 240-foot, 230 kV transmission line will be strung between the power plant's switchyard to PG&E's existing system with no additional structures required. Soils along this route include the Sunnyvale silty clay and Montara rocky clay loam. Montara rocky clay loam is shallow (approximately one foot to bedrock), excessively drained soil with moderately rapid permeability. Slopes encountered with this soil will be between 15 and 50 percent and are rated moderate to high for erosion hazard. The route for the proposed wastewater discharge line and one of the water supply lines consists of Sunnyvale silty clay and Clear Lake clay. Clear Lake clay is somewhat poorly-drained with slow permeability. The slopes and erosion hazard for Clear Lake clay are the same as for Sunnyvale silty clay. The route proposed for the groundwater supply line to the new wells will encounter entirely Yolo silty clay loam.

Several natural gas pipeline routes are proposed to connect the MEC plant to PG&E's existing line just east of U.S. 101. Major soil mapping units likely to be encountered along these proposed routes include Montara rocky clay loam, Yolo silty clay loam, Riverwash, Cropley clay, Los Robles clay loam, Cortina very gravelly loam, San Benito clay loam, Climara clay and Maxwell clay. Riverwash is made up of loose sand, gravel and cobblestone. It is subject to movement by water flows and has excessive drainage. Cropley clay is well drained with slow permeability, slopes between zero and two percent and a none to slight erosion hazard rating. Los Robles clay loam is well drained with moderately slow permeability, slopes between two and nine percent and an erosion hazard rating of slight to moderate. Cortina very gravelly loam drains somewhat excessively, has rapid permeability, slopes between zero and five percent, and a "none to slight" erosion hazard. San Benito clay loam drains well, has moderately slow permeability with slopes between 30 and 50 percent and a high erosion hazard rating. Climara clay drains well, has slow permeability, slopes between 15 and 50 percent and has

a high erosion hazard. Maxwell clay is moderately well drained, has slow permeability, slopes between two and five percent and has an erosion hazard rating of “none to slight”. Maxwell clay, Climara clay and Montara rocky clay loam as classified as non-prime agricultural land.

The preferred route for the recycled water supply line is the SBWR Route. The majority of the route will encounter Yolo silty clay loam, Campbell silty clay and Zamora clay loam. Campbell silty clay is somewhat poorly drained with moderately slow permeability. Slopes are less than one percent and the erosion hazard is “none to slight”. Zamora clay loam is well drained with moderately slow permeability. Slopes are 0 to 2 percent and the erosion hazard is none to slight. Because this route is located in an area that is mostly developed, these soils have already experienced disturbance.

For a complete list of the soil types and their characteristics, please refer to section 8.9.1.7 of the AFC and in Supplement A, Figures 3.9-1a and 1b.

SURFACE WATER

Two creeks are located adjacent to the proposed power plant site. Fisher Creek forms the north and west boundary of the proposed site and is a tributary to Coyote Creek. Fisher Creek empties into Coyote Creek just north east of the proposed plant site. Coyote Creek flows north approximately 38 miles to the San Francisco Bay. These creeks are described as both “gaining” and “losing” creeks: at points along their routes and depending on the season, the creeks recharge groundwater through percolation (losses) and/or are recharged by groundwater (gains). However, in the Coyote Valley, Coyote Creek is essentially only a losing creek. The total watershed area for the creeks is 15 square miles. RWQCB designated beneficial uses for Coyote Creek include wildlife habitat, species preservation and recreation (SFBRWQCB 1995; Calpine/Bechtel 1999a, p. 8.14.2). No specific beneficial uses are designated for Fisher Creek. Small earthen levees separate the site and Fisher Creek. As pointed out by the Santa Clara Valley Water District (SCVWD), the existing levees do not provide adequate flood protection to the site (SCVWD 1999b).

GROUNDWATER – SANTA CLARA VALLEY BASIN

Santa Clara Valley is underlain by the Santa Clara Valley Groundwater Basin. This basin is divided into three, hydraulically connected subbasins with flows trending northward. The Santa Clara Valley Subbasin, with a surface area of 225 square miles (22 miles long and 15 miles wide), extends from the Coyote Narrows to the County’s northern boundary. SCVWD estimates operational capacity of this subbasin to be 250,000 acre-feet a year, up from Department of Water Resources’ (DWR) 1980 estimates of 157,000 acre-feet a year. At the Coyote Narrows (identified as a cascade), approximately 5,000 acre-feet a year of groundwater flows from Coyote Valley Subbasin north to Santa Clara Valley Subbasin (Iwamura 1995; DWR 1980; Calpine/Bechtel 1999I, Data Response WR-141). Coyote Valley Subbasin extends from the Coyote Narrows south to Cochran Road with a surface area of approximately 15 square miles (7 miles long by 2 miles wide). Although DWR’s projected (1980) annual safe yield of the subbasin at 10,600 acre-feet a

year is thought to underestimate groundwater resources (Iwamura 1995), SCVWD has not yet determined an annual operational capacity for Coyote Valley Subbasin. Separated by a topographic divide, Coyote Valley Subbasin also flows into Llagas Subbasin to the south. The Llagas Subbasin runs from Cochran Road to the County's southern boundary, approximately 15 miles long and 3 miles wide, covering a surface area of approximately 74 square miles. In 1980, DWR estimated the safe yield of Llagas Subbasin to be 68,700 acre-feet a year and since then, SCVWD has increased this to an operational capacity of 150,000 acre-feet (Iwamura 1995; DWR 1980). Because of the large number of wells in the County, SCVWD has deemed the entire Santa Clara Groundwater Basin a wellhead protection area (SCVWD 1999c).

Regional Water Quality Control Board designated beneficial uses for Santa Clara Valley Groundwater Basin include municipal and domestic, industrial process and industrial service, and agricultural water supplies (SFBRWQCB 1995b). Beneficial uses for the subbasins are not differentiated.

COYOTE VALLEY SUBBASIN

Non-water bearing consolidated bedrock formations comprise the mountainous areas and the basement boundaries of the basins. Alluvium washed in from the surrounding mountainous areas and constitutes the water-bearing formations of Santa Clara and Coyote Valleys. Alluvium and the Santa Clara Formation represent a section of interbedded sand, gravel, clayey gravel, silt and clay overlain by younger alluvium comprising the water bearing formation. Maximum depth of the alluvium in the Coyote Valley Subbasin ranges from about 500 feet near the topographic boundary to about 150 feet at the north end near the Coyote Narrows. Groundwater levels are approximately 2 to 8 feet below ground surface but during wet years can be at surface levels near the north portion of the Coyote Valley. Coyote Valley Subbasin is essentially unconfined and laterally bounded on its eastside by the Santa Clara Formation and on its west side by the bedrock of the Santa Cruz Mountains. Groundwater moves in a north-westerly direction down the Valley toward Coyote Narrows and discharges into Coyote Creek. Groundwater quality information is provided in **Soils & Water Resources Table 1**.

Coyote Creek enters the Valley floor from the eastside of Diablo Ridge (near the topographic boundary with Llagas Subbasin). The MEC site is located in what used to be called the Laguna Seca area of the Coyote Valley. Prior to the installation of a drainage system, groundwater at Laguna Seca would naturally rise and discharge to the surface as a result of the rising bedrock and the narrowing of the basin (Iwamura 1995, DWR 1980).

In 1995, total annual groundwater extraction of the Coyote Valley Subbasin was estimated at 10.7 million gallons a day (mgd) or 12,000 acre-feet per year (Calpine/Bechtel 1999a, p. 8.14-11). Recently, and in cooperation with the SCVWD, the Applicant conducted a groundwater analysis to assess the current condition of the subbasin. Using SCVWD data, Calpine/Bechtel estimated that the Coyote Valley Subbasin is roughly in balance: total estimated inflows and outflows from Coyote Valley Subbasin are 20,000 acre-feet a year (Calpine/Bechtel 7/31/00

SOILS & WATER RESOURCES Table 1
Coyote Valley Subbasin Groundwater Quality*

(all units mg/L unless specified)

Constituents	Concentrations	
Inorganics	Minimum	Maximum
Alkalinity (total)	182	270
Aluminum	< 0.005	0.05
Arsenic	< 0.001	< 0.001
Barium	0.099	0.13
Cadmium	< 0.0005	< 0.0005
Calcium	38	118
Chlorides	13	50
Copper	0.0014	0.05
Fluorides	0.12	0.14
Iron, dissolved	0.019	0.1
Lead	< 0.002	0.012
Magnesium	23	41
Manganese	< 0.02	< 0.02
Mercury	< 0.0005	< 0.0005
Nickel	< 0.002	0.01
Nitrates	14.5	98
Potassium	0.89	1.47
Selenium	< 0.001	< 0.001
Sodium	21	37
Sulfates	30	62
Zinc	< 0.05	0.05
Other		
Ph	7.1 std units	7.9 std units
Hardness as CaCO ₃	214	304
Conductivity	470 umhos/cm	711 umhos/cm
Temperature	17 C	19 C
Color	< 0.1 units	5 units
Turbidity	0.09 NTU	5.5 NTU
TDS	290	461

Source: Calpine/Bechtel 1999l, Table WR-144-2.

* Data were available for four wells SCVWD sampled in 1999 and San Jose MUNIs 1987 sampling of its three test wells and the 1999 sampling of its active production well (one of the test wells).

Groundwater Analysis). Recharge is by surface water percolation, rainfall, irrigation returns, runoff from bedrock uplands and subsurface inflows from bedrock basin boundaries (Iwamura 1995; Calpine/Bechtel 1999a, p. 8.14.11-12; Calpine/Bechtel 2000q, Coyote Groundwater Report).

SANTA CLARA VALLEY WATER DISTRICT

As the water resource management agency for Santa Clara County, the Santa Clara Valley Water District (SCVWD) provides water supplies (local and imported) and flood control services to approximately 1.5 million people. SCVWD provides wholesale water services to 13 municipal and private water retailers in the County. Two water retailers, San Jose Municipal Water System and Great Oaks Water

Company, provide water service to Coyote Valley customers. The District also provides direct services to agricultural customers and private well owners. Current water demand in Santa Clara County ranges from 350,000 to nearly 400,000 acre-feet per year (SCVWD 2000b; 2000c).

SCVWD operates a system of reservoirs, canals, pipelines, treatment plants, and distribution facilities. Surface water supplies are contained in the District's 10 reservoirs with an estimated total storage capacity of 173,000 acre-feet (SCVWD 1997; 1999a). Yearly average surface flows that can be captured and diverted to the district's reservoirs, treatment plants or to the groundwater subbasins is about 101,000 acre-feet. This is reduced to approximately 59,000 acre-feet in critically dry years. Natural recharge to the basin adds another 112,000 acre-feet on average, reduced to 74,000 acre-feet in critically dry years (SCVWD 1997; 1999a; 1999d).

SCVWD also manages groundwater resources in the three interconnected subbasins described above and issues permits for wells extracting water from these basins. Historically, overdrafting of the Santa Clara Valley Basin has resulted in subsidence around San Jose. As a result, SCVWD began importing water supplies from the State Water Project (SWP) and the federal Central Valley Project (CVP) under long-term contracts (DWR 1980; County 1994, p. H-7; SCVWD 1997). As specified in their Integrated Water Resource Plan, SCVWD's SWP contract allows for 100,000 acre-feet per year and on average receives 74,000 acre-feet per year. CVP average yearly deliveries are approximately 125,000 acre-feet per year (the contract allows for 152,500 acre-feet per year). During critical dry periods these deliveries can drop to 47,000 acre-feet and 110,000 acre-feet, respectively (SCVWD 1997; 1999a). In addition, the District operates and maintains recharge ponds with combined surface area in excess of 320 acres and utilizes local creeks for additional groundwater recharge.

During the last major drought period (1987-1992), available water supplies could not meet Santa Clara County water demand (SCVWD 1997; 1999d). By 2020, the District expects water demand could reach as much as 500,000 acre-feet per year. In the event that no further actions are taken by the district to expand available water resources, the District predicts that a water shortfall of 100,000 acre-feet could occur (SCVWD 1997). To ensure adequate supplies are available to meet demand in the future, SCVWD is recommending several strategies such as additional water banking, conservation, increasing imports and expanded use of recycled water where possible, to augment the efforts it is already undertaking (SCVWD 1997; 1999a).

SAN JOSE MUNICIPAL WATER SYSTEM DIVISION

The San Jose Municipal Water System Division (San Jose MUNI) now serves four different areas in the City of San Jose: North San Jose/Alviso, Evergreen, Edenvale, and Coyote. These service areas comprise about 10% of the City's population and 33.3 square miles. The annual water production is 6,142 million gallons (approximately 19,000 acre-feet) with a maximum daily production of 34.4 million gallons. While San Jose MUNI service territory is only 12% of the City's total land area, it represents 39% of the City's developable lands (SJ 1999d).

In 1986, San Jose MUNI installed three water supply wells (Wells 21-23) to draw water from the Coyote Valley Basin. These wells are located approximately 400 feet apart from each other, upgradient from the MEC site and just west of the railroad, and 400 feet north of Bailey Road. Each well is about 270 feet deep with two screened intervals of 90 feet to 150 feet and 170 feet to 250 feet below grade (Calpine/Bechtel 1999c). The wells were designed for an individual capacity of 2,000 gpm. The capacity of each well was tested when the other wells were not in operation (Calpine/Bechtel 1999a, p. 7-6). Capacity of the wells under simultaneous operation is not known and may be less than 6,000 gpm. Only Well 23 is operational today at a rate of 300 gpm and the other two are capped. This groundwater currently is used for irrigation purposes (Calpine/Bechtel 1999a, p. 8.14-2). In the draft Environmental Impact Report for Coyote Valley Research Park (CVRP), the City indicated that Wells 21-23 would be used to meet the needs of CVRP and would not be available to MEC (SJ 2000a). In their letter dated March 21, 2000 to Ken Abreu, the City stated additional infrastructure is required because existing system is not adequate to serve MEC.

Two San Jose MUNI water supply lines are located in proximity of the MEC site. An 18-inch line is on the east side of Santa Teresa Boulevard and a 12-inch diameter pipeline is on the west side.

GREAT OAKS WATER COMPANY

Great Oaks Water Company (Great Oaks) is an investor owned utility under the jurisdiction of the California Public Utilities Commission (CPUC). A potable water retailer in the San Jose area, Great Oaks obtains its water resources from 13 deep wells located mostly north of Tulare Hill (no surface water connections). Great Oaks is assessed extraction fees by SCVWD for this groundwater that the District uses to purchase water supplies for groundwater replenishments and management of the Districts programs. In addition to these wells, Great Oaks operates storage tanks and distribution facilities. Current available supplies are on the order of 28,685 gpm (Great Oaks 1999).

Great Oaks' service area is bounded by Snell Avenue of the west, Coyote Valley on the south, just east of Highway 101 on the east and Riverview Drive on the north. Great Oaks currently serves more than 20,000 customers in the San Jose area, primarily residential customers (about 70 percent) with a mix of industrial, commercial and public agencies making up the remaining 30 percent. Peak water demand is approximately 18,803 gpm and, in 1999 exceeded 12,600 acre-feet a year. The company expects customer growth of approximately 5-10 percent over the next 20 years (Great Oaks 1999).

Great Oaks has been certified by the CPUC to provide water service to portions of Coyote Valley under decision 85-06-022 dated June 5, 2000. In an advice letter to the CPUC dated April 24, 2000, Great Oaks requested that the MEC parcel be included in the area certified for service (Advice Letter No. 149). The CPUC is currently considering this letter (Great Oaks 2000a). In the event that Great Oaks is the chosen water service provider, the Company expects to build wells with total

capacity greater than that required for normal plant operations to meet fire flow requirements (4,500 gpm) or, perhaps, acquire the three existing MUNI wells and increase their capacity. Great Oaks has stated that it will be responsible for financing and constructing the required infrastructure to serve MEC. New wells could possibly be located 3,500 feet southeast of the MEC site between Monterey Highway and Coyote Creek. Depending on the location of the new wells, the screening intervals will be approximately 100 to 200 feet, with a total depth not likely to exceed 300 feet. Great Oaks will need to obtain a permit for these wells from SCVWD and construct the wells in accordance with state and local requirements (Great Oaks 2000a).

According to Dan Stockton, Great Oaks Water Company provides only potable water service at this time. At the March 22, 2000 staff workshop, Mr. Stockton stated that the company is not currently a retailer for recycled water, nor does the company control any facilities necessary to convey recycled water to their customers. Based on information received from Mr. Stockton and Randy Shipes with the City of San Jose, Great Oaks would need to obtain the rights to retail recycled water from the City and install additional infrastructure to get recycled water to their customers.

SAN JOSE/SANTA CLARA WATER POLLUTION CONTROL PLANT

The San Jose/Santa Clara Water Pollution Control Plant (WPCP) treats wastewater from San Jose, Santa Clara, Milpitas, Campbell, Cupertino, Los Gatos, Monte Sereno and Saratoga, serving an area of over 300 square miles (SJ 1999d). WPCP serves more than 1.3 million residents and 16,000 businesses. Responsible for operation and maintenance of the plant, the City of San Jose is the administering agency for the joint powers authority.

Nominal treatment capacity at the plant is 167 mgd; although at times, if needed, more effluent can be treated. Annual mean effluent flow into Artesian Slough, tributary to Coyote Creek and South San Francisco Bay, was 133 mgd in 1998 (SJ 1999c; Calpine/Bechtel 1999h: WR-114C – City of San Jose Annual 1998 Self-Monitoring Report, January 19, 1999). Recently, WPCP has achieved an average dry weather discharge effluent flow of 120 mgd. According to the City, the WPCP has less than 25 mgd available capacity for its entire service territory and only 12.31 mgd treatment capacity is available to new discharges in San Jose. Based on approvals given as of March 1999 by the City to new development, 5.75 mgd of additional flow for treatment will be going to WPCP (SJ 1999a).

Pursuant to the SFBRWQCB's Order 98-052, WPCP must not exceed discharges to the south San Francisco Bay of 120 mgd average dry weather effluent flow. This discharge limit has been imposed to protect habitats of two endangered species, the California clapper rail and the salt marsh harvest mouse. To lower its discharge amounts, the WPCP has undertaken conservation efforts, environmental enhancements, and the delivery of disinfected, tertiary-treated, recycled water which meets California's Title 22 standards through the operation of the South Bay Water Recycling Program (SJ 1999; 1999a).

SOUTH BAY WATER RECYCLING

South Bay Water Recycling Program (SBWR) is operated by the City for the San Jose/Santa Clara WPCP and provides disinfected tertiary-treated water for appropriate non-potable uses to more than 260 customers. More than 70 percent of these customers use the water for landscape irrigation while the remainder is for industrial processes. SBWR's recycled water product meets California's Title 22 requirements (for more information on these requirements, please see the **Public Health** section of this FSA). The recycled water quality requirements that must be maintained by the SBWR are stipulated in RWQCB Order 95-117 and are described in the South Bay Water Recycling Operations Manual (revised January 2, 1998). With its existing system, the SBWR is capable of delivering up to 50 mgd of "unrestricted quality" reclaimed water for irrigation and industrial uses. Today, summer use is 8 to 10 mgd with peak daily demands as high as 11.3 mgd (SJ 2000d). **Soils & Water Resources Table 2** provides information on the quality of SBWR's recycling water product.

At this time, SBWR facilities do not extend as far south as Coyote Valley. A portion of the SBWR supply network follows Senter Road near Capital Expressway in San Jose. North of the expressway, the pipeline is 42 inches in diameter and south of the expressway it is 30-inches in diameter. The Applicant is proposing to interconnect into the 42-inch line above the terminus. The City has indicated that if appropriate infrastructure can be put in place to make recycled water available to Coyote Valley, adequate capacity exists to serve MEC (Calpine/Bechtel 1999h: WR-115A; SJ 1999b). Requirements exist for the planning, constructing and operating a recycled water system for both new and existing development. Site-specific requirements may be set forth in the Recycled Water Use Permit issued by the City (SJ 1999).

ENVIRONMENTAL IMPACTS

PROJECT SPECIFIC

As proposed by Calpine/Bechtel, the 600 MW MEC will be located on approximately 20 acres at the southern base of Tulare Hill in South San Jose. A temporary construction laydown and parking area is also proposed just south of the power plant site on 20 acres. After construction is completed, the laydown area will be returned to its previous condition. Approximately 10 acres of the site will be covered with impervious surfaces and the remaining area within the fence line will be vegetated (Calpine/Bechtel 1999q, WR-212; BR-156; 2000m). Natural gas to fuel the facility will be delivered via a new 16-inch, underground pipeline that will travel one mile to PG&E's existing facilities east of U.S. 101. Two access roads will also be constructed. For a more detailed discussion of the proposed project, please see the **Project Description** section of this FSA.

SOILS & WATER RESOURCES Table 2
Estimated SBWR Recycled Water Quality

Constituents	Concentration
Cations (total as CaCO ₃)	633 mg/L
Calcium	50.7
Magnesium	29.5
Sodium	166.4
Potassium	14.7
Iron (dissolved)	0.1
Manganese	0.1
Ammonia (as NH ₄)	1.1
Anions (total as CaCO ₃)	633 mg/L
Sulfate	120
Chloride	209
Fluoride	0.1
Nitrate (as NO ₃)	58.9
Phosphate	5.5
Alkalinity (as CaCO ₃)	157
Metals	mg/L
Arsenic	0.0014
Barium	0.010
Beryllium	0.001
Boron	0.5
Cadmium	0.001
Chromium	0.0008
Copper	0.0042
Lead	0.0011
Mercury	0.00009
Nickel	0.0077
Silver	0.001
Selenium	0.001
Thallium	0.001
Zinc	0.049
Other	
TOC	6.7 mg/L
Turbidity	1.0 NTU
Silica (dissolved)	22 mg/L
TDS	782 mg/L
TSS	1.1 mg/L
Settleable Solids	0.0
BOD	2.7 mg/L
Oil & Grease	1.7 mg/L
PH	7.2 std units

Source: Calpine/Bechtel 1999a, Table 8.14-3 based on SBWR data for March 1994 to August 1998.

MEC's processes will require an average of 3.5 mgd of water and peak usage is expected to be 5.4 mgd (Calpine/Bechtel 2000q -IWD Application; 2000r). As proposed, three water systems will be required to serve the MEC: recycled water system for cooling purposes; a potable water system for process, domestic and back-up cooling water needs; and an industrial wastewater discharge system for all plant wastewater streams (Calpine/Bechtel 1999a, 1999e, 2000b). **Soils and Water Resources Table 3** provides Calpine/Bechtel's detailed estimates for the volumes of water required by MEC. Major linear facilities needed for these systems include a 10.2-mile, 20 inch interior diameter recycled water supply pipeline and short lateral pipelines for the industrial wastewater discharge line and domestic water lines. In addition, a demineralized water storage tank will hold approximately 153,000 gallons of water representing a 24-hour supply. The Applicant proposes a storage tank that will contain approximately 240,000 gallons of fire service water and 30,000 gallons of plant service water.

SOILS & WATER RESOURCES Table 3
Estimated Water Demand for the MEC

Project Element	Water Type	Quantity*
<i>Peak Operating Conditions - 90 Degrees F, 5 Cycles of Concentration</i>		
Cooling Towers	Recycled	3,094 gpm/4.5 mgd (4.7 mgd)**
Industrial Processes and Domestic Uses		
Steam Cycle Make-up		223 gpm
Evaporative Cooling		105 gpm
Oil/Water Separator		10 gpm
Domestic		2 gpm
Total	Potable	350 gpm/0.5 mgd (0.7 mgd)**
<i>Average Operating Conditions - 60 Degrees F, 5 Cycles of Concentration</i>		
Cooling Towers	Recycled	1,953 gpm/2.8 mgd (3.3 mgd)**
Industrial Processes and Domestic Uses		
Steam Cycle Make-up		49 gpm
Evaporative Cooling		24 gpm
Oil/Water Separator		10 gpm
Domestic		2 gpm
Total	Potable	85 gpm/0.1 mgd (0.2 mgd)**

* Source: Calpine/Bechtel 1999a, Tables 7.1-1 & Table 7.2-1; 1999q, WR 212 (5 cycles only); Staff Workshop, March 22, 2000; Calpine Bechtel 2000r, Project Description. Other estimates of water use include that contained in a December letter to Dan Stockton from Calpine/Bechtel which was included in the Data Responses Set 4A (1/11/00), MEC stated their water supply needs as: Domestic/ Noncooling Industrial Uses Peak = 0.5 mgd; Average = 0.2 mgd; Cooling Towers Peak = 4.5 mgd; Average = 3.3 mgd; Total Water needs are 5.0 mgd peak and 3.5 mgd average; the draft Wastewater Discharge Application listed the average use as 2.9 mgd and the peak at 5.9 mgd (Calpine/Bechtel 2000q).

EROSION CONTROL AND STORMWATER MANAGEMENT

Accelerated wind and water induced erosion may result from earth moving activities associated with construction of the proposed project. Removal of the vegetative cover and alteration of the soil structure leaves soil particles vulnerable to detachment and removal by wind or water. Construction and maintenance-related erosion is of particular concern in areas of steep slopes and sandy soils. Increasing the amount of impervious surfaces will increase the amount of runoff and peak discharges from a development. Rainfall can greatly enhance the potential for water erosion. Grading activities may redirect runoff into areas more vulnerable to erosion. Areas where linear facilities cross drainages or steep sloped terrain are also vulnerable to erosion. See **Soils and Water Resources Table 4** for estimates of the amount of land disturbance the proposed project is likely to cause.

SOIL & WATER RESOURCES Table 4
Estimated Land Disturbance

Project Component	Construction (acres)	Operation (acres)
Generating Plant (includes temporary construction laydown area)	40	20
Transmission Line	0	0
Natural Gas Pipeline	11	0
Water Pipelines*		
Reclaimed Water (SBWR)	85.2	0
Segment B-3*	4.1	0
Potable to Well 23	11.4	0
Access Roads		
To Blanchard Rd.	0.6	0.6
Western Access	2.5	1.8
Total	154.8	22.4

Source: Calpine/Bechtel, 2000k, PSA Comments Set 8; 2000r; John Carrier, CH2MHill, Aug. 2000.

* Portions of the water lines will run under the Western Access Road and is accounted for in the access road acreage.

** Segment B-3 includes the domestic water, sewer and wastewater lines to Santa Teresa Boulevard.

Soils that will be affected by the proposed project range in the rated susceptibility to erosion from none to high (Calpine/Bechtel 1999a; 1999e). Once the protective cover of vegetation is removed and the structure of the surface soil has been altered, however, all of these soils can be highly vulnerable to erosion - soil susceptibility to erosion will no longer be "none". Site preparation will include excavation, grading, removal of vegetation and storage and disposal of various materials. Approximately 10.7 acres of the site will be raised 5 feet above the existing levees separating Fisher Creek from the plant site and providing a level area for the power plant at an elevation of 255 feet msl. To accomplish this desired elevation, 95,000 to 100,000 cubic yards of fill will be required, obtained by Calpine/Bechtel from a qualified supplier in the South Bay area (Calpine/Bechtel 2000ff, Data Response 5). Some vegetation removal and earth moving activities will likely be needed for the construction laydown area.

Where possible, topsoil from the power plant site will be removed and stored for use in revegetation efforts. Slopes for perimeter embankments will be sloped to 3:1 (horizontal:vertical) and those near the detention basin will be 4:1 (Calpine/Bechtel 2000d). The Applicant proposes to revegetate the side slopes (including the grade between the cooling towers and the setback area) of the site to prevent erosion. Surface materials to be used at the site will include concrete, asphalt and /or gravel. Graded surfaces will have a mild slope of about one percent resulting in surface runoff flowing toward the southwest of the site to the detention pond (Calpine/Bechtel 1999q, Data Response BR 159; Calpine/Bechtel 2000d). The cooling tower pad will be graded away from the riparian corridor.

New temporary and permanent disturbances will occur as a result of constructing and operating the new linear facilities, such as trenching, grading, and backfilling. Actions will need to be taken to minimize impacts associated with soil disturbance during the construction and maintenance of the linear facilities for this project, particularly in hilly, steep sloped areas. Two new roads will be cleared and graded to allow access to the MEC site. Connecting the site to Monterey Highway, a two-lane road will parallel the UPRR tracks and provide a crossing at Blanchard Road. The road will be approximately 32 feet wide and covered with an asphalt/concrete mix. The 2-laned western access road (Calpine/Bechtel 2000k) will be approximately 1,500 feet long, likewise covered with a asphalt/concrete mix. This road will connect into the proposed CVRP road system and only be constructed if certain conditions are met. If constructed, it may result in minor changes to the routes for the water-related pipelines.

As proposed, the natural gas line will be buried. Horizontal directional drilling will be used to place the natural gas pipeline below roadways and Coyote Creek. It is expected that the pipeline will be as much as 60 feet below Coyote Creek using this drilling method (Calpine/Bechtel 2000q, draft Streambed Alteration Agreement). Efforts will be taken to ensure drilling fluids do not leak into the waterway and avoid erosion along the creek banks. The 240-foot, 230 kV transmission line will be strung between the power plant's switchyard to PG&E's existing system with no additional structures required. Minimal soil disturbance is expected during the installation of the transmission line.

Calpine/Bechtel (1999e; 1999f) revised their proposed recycled water supply line in Supplement A and B. Recycled water will be delivered to the power plant via a new underground, 10-mile connection to SBWR's 42-inch supply main located in Senter Road near Capital Expressway. The majority of this route is along existing roadways through residential and business districts. At Santa Teresa Boulevard, the recycled water supply line will travel north through predominately residential neighborhoods to the SBWR mainline near Senter Road and Capital Expressway. In the AFC Supplement A (Calpine/Bechtel 1999e), the Applicant proposes to place a portion of the recycled water supply pipeline and possibly the two other water system pipelines in a single corridor approximately 66 feet wide and 0.8 miles long (Segment B-3). Three separate trenches no less than 10 feet apart (per City of San Jose requirements), each approximately five feet deep and four feet wide, will run along the south side of Fisher Creek from the MEC site to utilities located in Santa

Teresa Boulevard, west of the site (Calpine/Bechtel 1999e; SJ 1999a). Other proposed water supply pipelines include a 1.25-mile, 24-inch pipeline along the western portion of the railroad right-of-way from the MEC to San Jose MUNI Well 23 near Bailey Road and a pipeline from the MEC site to Great Oaks Water Company's system located in Santa Teresa Boulevard.

During project operation, wind and water action can continue to erode unprotected surfaces. An increase in the amount of impervious surfaces can increase runoff, leading to the erosion of unprotected surfaces. The Applicant will be required to comply with the general National Pollution Discharge Elimination System permits for both construction and operation of the MEC, which include requirements for the development and implementation of a Stormwater Pollution Prevention Plan. Calpine/Bechtel developed a revised draft Erosion Control and Stormwater Management Plan as well as a Stormwater Pollution Prevention and Monitoring Plan for the current proposed plant (Calpine/Bechtel 2000h; 2000m; 2000o). Changes to the project were made since these draft plans were submitted to the Commission and staff requested that updated plans be provided. These revised plans are discussed later in this section.

STORMWATER DISCHARGE

A system of ditches, culverts, catch basins and maintenance holes will convey stormwater to an unlined stormwater detention basin that will discharge directly to Fisher Creek (Calpine/Bechtel 2000b). SCVWD has specified that the stormwater detention pond will need to be sized and operated to accommodate the increased site runoff due to impervious surfaces (10 acres) to maintain post-development peak storm discharges at or below pre-development rates (SCVWD 1999a).

As described in Supplement C, the Applicant reconfigured the plant and placed the stormwater detention pond in the southwest corner of the site outside of the 100-foot riparian corridor setback area per the direction of the City of San Jose (Calpine/Bechtel 1999e, p. 3-15). As proposed, this basin will be sized to provide protection against the 10-year and 100-year, 24-hour storm events. The Applicant has identified that the 10-year, 24-hour duration storm will produce 4.63 inches of rainfall and the 100-year, 24-hour duration storm will produce 6.89 inches (Calpine/Bechtel 2000j). The top of the basin will be at 254 msl with a total capacity of 1.9 acre-feet.

In addition, as required by SCVWD, the discharge pipe is to be placed in the levee that separates the creek from the site (rather than an open swale as originally proposed, Calpine/Bechtel 1999e, p. 3-25). The Applicant will cut a trench, position the pipe and replace the topsoil with a rip rap apron from the outfall into Fisher Creek. Construction of the stormwater discharge structure to Fisher Creek, which is considered under the Clean Water Act as a Waters of the United States, will require a Nationwide Permit Number 7 from the U.S. Army Corp of Engineers and a 401 certification from the RWQCB. A Streambed Alteration Agreement will be required from the California Department of Fish and Game for both the levee related work and the drilling underneath Coyote Creek. Copies of draft permit applications were submitted for staff's review. Calpine/Bechtel, as part of their draft example of a

streambed alteration agreement, is proposing measures to reduce or eliminate sedimentation and erosion such as silt fencing, hay bales and revegetation. These permits and their requirements are also discussed in more detail in the **Biological Resources** section of this FSA.

WATER SUPPLY

MEC will use recycled water in the wet-cooling towers to reject heat from the steam cycle of the power plant. Approximately 94 percent of the water to be used at MEC will be for cooling purposes. MEC cooling towers will cycle the water five times, evaporating off more than 80 percent of the water. Calpine/Bechtel propose to use local groundwater resources for process (steam cycle) and domestic water needs, as well as back-up supplies for cooling purposes (Calpine/Bechtel 1999a; 1999h, Data Response WR-134; 1999i; 2000a). Possible water retailers for MEC are San Jose MUNI or Great Oaks Water Company.

At this time, the Applicant has not yet decided on the water purveyor and a decision is not likely until after the San Jose City Council takes action on the annexation and planned development rezoning (Calpine/Bechtel 2000e). According to the Applicant, only one water supplier will be used for all water needs of the MEC. Both San Jose MUNI and Great Oaks have stated their interest and ability to serve MEC's water needs. Currently, San Jose MUNI is the only licensed purveyor of SBWR recycled water in the area. Mr. Stockton (Great Oaks) stated that the company is interested in being a retailer of recycled water but has not yet pursued the necessary approvals (CEC March 22, 2000 workshop). Both potential water suppliers confirmed the need for new infrastructure to provide groundwater service to MEC.

On-site fire water storage (240,000 gallons) represents approximately 2 hours of fire protection in the event of fire at the plant. Normally, the city requires a 4,500 gpm for 4-hour event protection (June 25, 1999 Janis Moore Memo). To augment on-site storage and satisfy this requirement, the Applicant is proposing to obtain back-up emergency fire water from Great Oaks (Calpine/Bechtel 2000aa, WR-237). In the event San Jose MUNI is chosen to serve MEC, it is assumed a similar arrangement will be made regarding fire water supplies.

Estimated average usage of recycled water is 3.3 mgd (2,292 gpm) and a peak of 4.7 mgd (3,264 gpm). Annual demands in a "peak year" (1 month peak and 11 months average operation) will require 3,826 acre-feet a year of recycled water (Calpine/Bechtel 2000g). Under a tentative agreement, SBWR has indicated that as much as 5 mgd of disinfected, tertiary treated recycled water can be supplied to MEC (SJ 1999a; SJ 1999b), representing 10 percent of the SBWR program capacity at buildout (SJ 2000d). Based on the Applicant's calculations, a 20-inch diameter pipeline will be able to deliver 3,300 gpm (Calpine/Bechtel 1999e, Montgomery Watson Memo, May 3, 1999). Offering to compensate the Applicant for any additional costs, the City has requested that the recycled water supply pipeline be oversized. Increasing the recycled water supply pipeline from 20 inches to 42 inches will increase flow capacity by more than four fold and allow the City to provide recycled water service to other future customers in Coyote Valley

(Calpine/Bechtel 2000p). No recycled water storage facilities are proposed (Calpine/Bechtel 2000aa, WR 237) along the SBWR Route or at the plant site.

Potable water requirements for the MEC are estimated at 0.2 mgd (139 gpm) on average with a peak usage of 0.69 mgd (479 gpm) (CEC March 22, 2000 workshop, AFC estimates are different) or approximately 224 acre-feet a year under normal conditions. Conservative estimates show that when the back-up water supplies are required, the potable water demand can reach 940 acre-feet a year (assumes recycled water is not available for 45 days during the year). Although the Applicant originally proposed to use existing MUNI wells (Wells 21-23) in Coyote Valley, they indicated in their comments on the PSA that these wells are no longer available. New wells will need to be built (Calpine/Bechtel 2000aa, WR-236) with a combined capacity to meet MEC's peak demands. Also, Mr. Stockton suggested that Great Oaks may also extend their existing water system north of Tulare Hill into Coyote Valley (CEC 3/22/00 workshop).

Calpine/Bechtel identified two wells locations that they believe would be adopted by either potential retailer (no on-site wells will be constructed) (Calpine/Bechtel 2000b; 2000q). These wells were located about 2,500 feet to 3,000 feet southwest and south of the MEC site. Calpine/Bechtel expects that the wells will be approximately 300 feet deep with an 18-inch diameter well head, pump and pump enclosure approximately 10 feet square and 12 feet high. Underground pipelines would be constructed to convey the groundwater to the plant – one along the west side of the UPPR tracks and the other running north to the Segment B-3 corridor (Calpine/Bechtel 2000q Groundwater Supply System).

GROUNDWATER IMPACTS

Under normal conditions, groundwater will be used to support steam cycle and domestic water requirements for MEC. Under unusual circumstances, groundwater will also be required as back-up for the cooling system. According to the Applicant, interruptions in the recycled water supply are expected to occur 2 to 3 times a year up to 72 hours in duration, but long, unplanned interruptions may also occur. Information staff had reviewed previously shows that more water was being extracted from this subbasin (as estimated in the AFC, 12,000 acre-feet a year) than had been identified as the safe yield (10,600 acre-feet by DWR 1980). Since the San Jose area has experienced overdraft of groundwater and considerable subsidence problems (DWR 1980, SCVWD 1997, SJ 1999a), staff requested that the Applicant conduct a groundwater analysis to determine potential impacts to the Coyote Valley Subbasin from increased extractions.

According to the SCVWD, the County has adequate groundwater resources in the county to serve the short-term emergency needs of MEC in the event that recycled water is not available (SCVWD, letter to Paul Richins, Dec. 2, 1999). In its subsequent letter to the Commission, the SCVWD (2000b) stated that a groundwater study of the potential impacts associated with supplying the MEC with back-up water from groundwater supplies is not warranted. This position is based on an assessment that "the expected one-month emergency demand for the proposed project would only amount to approximately 6 percent of the 1999

groundwater demand in Coyote Valley (SCVWD 2000b). SCVWD's assessment considers the entire county's resources and is based only on current demand for water. It did not take into consideration other proposed development within the North Coyote Valley that is proposing to obtain needed supplies from the Coyote Valley Basin. Staff concurs that the District possesses adequate water resources within the county to serve the MEC. However, the current proposal for back-up water supplies is to utilize groundwater from the Coyote Valley Subbasin. The proposed Coyote Valley Research Park also wants to use groundwater from the Coyote Valley Subbasin to meet its expected water demands. Prior information on the capacity of the San Jose MUNI wells and the groundwater resources in the subbasin did not support their use to serve both MEC and CVRP.

In cooperation with SCVWD, Calpine/Bechtel (2000q, Coyote Groundwater Report) conducted an analysis of the potential impacts to groundwater of extraction by MEC based on the two new well locations proposed. Included in this analysis was an evaluation of the cumulative impacts associated with both the Coyote Valley Research Project (CVRP) and MEC using groundwater to meet their potable water needs. Impacts were modeled assuming a 30-day continuous interruption of SBWR recycled water (similar to that, which occurred during the floods of 1997) and five 72-hour planned interruptions during a long-term drought (worse case) and under normal conditions. Modeling of the worse case conditions showed a maximal drawdown in the immediate vicinity of the new wells of 6.5 feet, 1 foot at 1 mile from the proposed well locations, and essentially undetectable at 2 miles away. Under normal conditions, maximal drawdown is much less. As many as 65 wells are within a mile of the proposed new wells and are likely to have been built to withstand seasonal fluctuations in groundwater levels (as much as 30 feet).

Cumulative impacts associated with both CVRP's and MEC's use of groundwater will result in an estimated overall drawdown throughout the Coyote Valley Subbasin of 8 feet during drought conditions and 10 feet within the immediate vicinity of the MUNI wells. Most of this impact is the result of CVRP's constant groundwater demand. SCVWD has indicated that increased water demand in Coyote Valley was anticipated in their Integrated Water Resource Plan and its resource management efforts can address these types of impacts to water supplies (SCVWD 2000d). These efforts include groundwater recharge and importation of water supplies.

Staff reviewed the Applicant's groundwater analysis and made an independent assessment on the potential impacts to groundwater resources and the local creeks. For a more detailed discussion of these impacts, please see Appendix C. In addition to the Applicant's findings listed above, staff found that the operation of MEC alone with its continual extraction for domestic and process water needs as well as occasional increased withdrawal for back-up supplies (no more than 45 days a year) will have a negligible impact on groundwater levels, outflow from Coyote Narrows, and Coyote and Fisher Creeks flows. When considering the potential impacts associated with the operation of both CVRP and MEC, staff found that potential significant impacts may occur to both the outflow from Coyote Narrows and to flows in Fisher Creek. The reductions in outflow from the Narrows can be addressed by increasing recharge of the subbasins and, thus not adversely affect water supplies. These efforts are anticipated in SCVWD's Integrated Water

Resource Plans and no additional mitigation is required. Reductions in the flows to Fisher Creek have the potential to affect biological resources, not so much water supplies or quality. For a discussion on the significance of reduced flows in Fisher Creek, please refer to the **Biological Resources** section of this FSA.

Also, the City of San Jose recommended that greater use of South Bay Water Recycling water could be made through dual plumbing of the facility, thus further reducing the potable water demand and still remaining under the maximum deliverable by SBWR (SJ 2000c). Staff agrees that dual plumbing can allow recycled water to be used for such non-potable uses as toilet flushing and equipment washing. Staff is recommending that MEC incorporate dual plumbing and use recycled water where possible.

WASTEWATER DISCHARGE

Average wastewater discharge from MEC (0.6 mgd) represents about 0.5% of the total flow to WPCP. With peak flows to WPCP reaching 1.0 mgd (727 gpm), the City required that Calpine/Bechtel use SBWR program's recycled water for the cooling process at MEC to minimize loads to the sewer system (SJ 1999a). Recycle water use will offset the increase wastewater discharge load to the WPCP and is considered by the City as the only acceptable alternative to keep WPCP effluent flows to the South Bay below 120 mgd as required under the current NDPS permit (SJ 2000b). In a July 16, 1999 letter to Calpine, the City indicated that it had adequate capacity to accommodate sewage discharge from the proposed power plant, but at that time, did not specify any conditions of acceptance (specified as 1.9 mgd peak for 3 cycles of concentration and 0.6 mgd average flow for 5 cycles) (Calpine/Bechtel 1999h, Data Response WR-128). Estimated MEC wastewater discharge quality is shown in **Soils and Water Resources Table 5**.

As described in Data Response WR-212 (Calpine/Bechtel 1999q), the Applicant proposes to recycle both the reverse osmosis concentrate and the heat recovery steam generator (HRSG) boiler blowdown to the cooling towers. Originally, only the HRSG blowdown was to be recycled. In addition, the cooling system will be operated at five cycles of concentration, not three. According to Calpine/Bechtel, this current proposed water use plan results in a reduction of the wastewater flow from 1.8 mgd to 0.61 mgd average daily flow. Prior to discharge of the cooling tower blowdown, other plant wastewater will be combined with it, including sanitary sewage and process wastewater (Calpine/Bechtel 2000b). All wastewater from the MEC will be discharged directly into the City's sanitary sewer line located in Santa Teresa Boulevard via a 0.8 mile, 12-inch forced main. This connection eliminates the need for an on-site packaged sewage system and holding tank as originally proposed (Calpine/Bechtel 1999a; 1999e; 1999h, Data Response WR 128).

SOILS & WATER RESOURCES Table 5
Estimated MEC Wastewater Discharge Quality

Constituents	Discharge Concentration	Allowable Concentration
Cations (total as CaCO ₃)	3,037 mg/L	
Calcium	254	35.0
Magnesium	146	
Sodium	780	
Potassium	63	
Iron (dissolved)	0.428	
Manganese	0.465	
Ammonia (as NH ₄)	4.78	
Anions (total as CaCO ₃)	3,036 mg/L	
Sulfate	1,100	
Chloride	996	
Fluoride	0.514	
Nitrate (as NO ₃)	258	
Phosphate	24	
Alkalinity (as CaCO ₃)	239	
Metals	mg/L	mg/L
Arsenic	0.007	1.0
Barium	0.154	0.75
Beryllium	0.0005	
Boron	2.133	0.7
Cadmium	0.005	
Chromium	0.011	1.0
Copper	0.02	2.7
Lead	0.005	0.4
Mercury	0.0006	0.01
Nickel	0.034	2.6
Silver	0.005	0.7
Selenium	0.008	2.0
Thallium	0.005	2.6
Zinc	0.412	
Other		
Silica (dissolved)	106 mg/L	
TDS	4,029 mg/L	
TSS	<30 mg/L	
Settleable Solids	0.0 mg/L	
BOD	<30 mg/L	
Oil & Grease	<10 mg/L	
PH	6-9 std units	

Source: Calpine/Bechtel 1999a, Table 8.14-3; 2000i.

* Data is based on peak operation (1.05 mgd discharge), 5 cycles of concentration for the cooling tower blowdown, 3 cycles of concentration for the evaporative cooler blowdown, and SCVWD groundwater resources.

Chemical treatment of the water will be required prior to use in the MEC processes. This treatment will include minor addition of conditioners (sulfuric acid, phosphate and sodium hypochlorite) to reduce corrosion and control mineral scaling and biofouling (Calpine/Bechtel 1999a, Section 2.2.7.2). (For a discussion of hazardous materials to be used at the MEC, please see the **Hazardous Materials Management** section of this FSA). Addition of condition chemicals and salts present in groundwater used at the facility will result in an overall salt loading to the wastewater of about 1,033 pounds per day or 5% over that which is delivered to MEC in the form of the recycled water (Calpine/Bechtel 2000i). MEC's processes will not add nutrient, biochemical oxygen demand (BOD), total suspended solids (TSS) or metals to the waste stream. However, by cycling water in the cooling tower and evaporating off most of the water, concentrations of the constituents in the water are increase several fold.

Analyses conducted by the City of San Jose and Calpine/Bechtel has determined that MEC's wastewater discharge result in a 3 percent increase in the overall salinity (TDS) levels of the SBWR product recycled water (Calpine/Bechtel 1999e). Although MEC's wastewater will comply with all specified limits, the City of San Jose has stated that the increase in salinity (TDS) that MEC will cause is unacceptable (CEC March 22, 2000 Workshop). As mentioned above, the increase in TDS concentrations in the wastewater is more a result of concentrating the water stream during the cooling process rather than adding constituents. TDS concentrations in the recycled water delivered to MEC are about 782 mg/l. MEC's combined wastewater discharge will be 4,029 mg/l (Calpine/Bechtel 2000i). The sheer volume of the concentrated discharge results in an increase of 3 percent to the overall SBWR recycled water product (from 782 mg/l to 805 mg/l).

As stated earlier, WPCP is required to have dry weather flows to the South Bay not to exceed 120 mgd and the city has achieved this target through conservation efforts, education and the SBWR program. As discharges to the City's system increase, it is important to maintain a quality recycled water product so as to expand its use in the County and divert effluent discharges to the South Bay. The City argues that any degradation of the recycled water product is unacceptable because it may make the recycled water unsuitable for some users and more difficult to market to new customers. Staff understands the City's concerns about the quality and marketability of the recycled water, particularly since the vast majority of current and anticipated (Phase II) uses for recycled water are irrigation (SFRWQCB 1995a). SCVWD is already opposed to the use of SBWR recycled water for irrigation purposes in active groundwater recharge zones because it can potentially increase groundwater salinity in the region. As a result, the City has stated that, if MEC is within the City's limits and it were required to issue a Industrial Wastewater Discharge permit today, it would require pre-treatment of the wastewater per Municipal Code Sections 14.15.595 and 15.14.353 (SJ 2000d).

Randy Shipes with the City of San Jose, also explained that MEC is not the only large wastewater discharger that is being asked to mitigate for salinity related impacts. A large industrial project in north San Jose, U.S. Data Port, has also been informed that barring a desalinization program established by the City, the project

will either need to pre-treat their wastewater prior to discharging it to the City's system or obtain their own NPDES permit for a brine line that would discharge to the Bay. As illustrated by MEC and U.S. Data Port, increases in the salinity of the recycled water product need to be addressed by the City and requirements placed on all future dischargers. Thus, the issue is more one of compliance of MEC with local wastewater discharge requirements.

In various filings, the Applicant argues that the impact of the waste discharge does not constitute a direct significant adverse impact to the environment, that the benefits of using recycled water outweigh any impacts and that the increased TDS concentrations does not cause the city to violate the NPDES permit for the WPCP's discharge. Calpine/Bechtel also point out that MEC will not be the only source of additional salinity. Staff understands Calpine/Bechtel's position that use of recycled water in the cooling process of MEC is beneficial, but also recognizes that it is a state requirement under Water Code Section 13550. Staff also agrees that other sources of salinity must be addressed at the same time. Although the wastewater-related impacts are not likely to cause a significant adverse environmental impact under the California Environmental Quality Act, staff can not consider the impacts of the salinity increase negligible.

OPTIONS FOR REDUCTION OF SALINITY IMPACTS ASSOCIATED WITH MEC WASTEWATER DISCHARGE

Impacts associated with salinity increases to the SBWR recycled water product can be addressed at the site of discharge or more centrally (i.e., at the WPCP). In the current proposal, MEC does not include pre-treatment of the wastewater stream prior to discharge. In the Applicant's recent report on the issue of increased salinity and in their January 4, 2000 letter to Eric Rosenblum (City of San Jose), they suggested several methods to address impacts associated with the salinity. Most of these methods focus on irrigators and changes in practices that the irrigators may employ. Other methods suggested by Calpine/Bechtel put the burden of mitigating the salinity on the SBWR program and its existing resources, calling for a sub-stream salt removal program or a dedicated brine line that would bypass the normal sewage system. Staff reviewed these suggestions and found that, if implemented, the burden and cost of mitigating the MEC salinity impacts would not necessarily be borne by Calpine/Bechtel. Staff believes that the responsibility for mitigating the MEC-related TDS impact is the responsibility of the Applicant.

To this end, staff believes that there are primarily three methods that can be employed by Calpine/Bechtel at the MEC to address TDS concentrations. First, staff believes there is merit to the recommendation of a centralized desalinization facility at WPCP. Recognizing the potential problems associated with increasing salinity in the recycled water from various sources, the City has indicated it is considering the establishment of a salt mitigation program that could institute additional fees on dischargers, limit TDS concentrations in discharge, and or develop a centralized desalinization facility fully integrated into the WPCP. In fact, the City has initiated the necessary process to establish such a program and is hopeful that the process will be complete within the next 18 months. Calpine/Bechtel and others could be assessed an additional fee (above what they

will pay for normal waste treatment at WPCP) that would cover their share of costs associated with the development of desalinization facility that can treat SBWR recycled water. A centralized facility is likely to be more efficient and cost effective in removing excess TDS of the overall recycled water product.

But as of yet, the City does not have a recycled water salinity control program in place and, thus, can not impose fees for this purpose on any of its discharges. It is possible that the City can have such a program in place within the next 18 months. In the event that the City's salinity mitigation program is in place prior to the issuance of the final wastewater discharge requirements permit, the final requirements imposed on MEC may not be on-site pre-treatment, but sharing the cost of centralized treatment.

DRY COOLING

Secondly, overall water consumption could be reduced by using a dry cooling system (for a more detailed discussion of dry cooling technologies and their associated issues, please see Appendix B). Water consumption for MEC could be reduced significantly with a dry cooling system, reducing the amount of water discharged by the facility and the extent of increased overall concentrations of the wastewater constituents. Use of a dry or wet-dry technology, although it may reduce water demand and wastewater discharge, may result in a shift in the types of impacts (such as air quality, visual resources or noise) that the project may cause. This is not to say that these other impacts will be significant or not, just different from those caused by wet cooling technologies. As presented in previous cases before the Commission, environmental considerations based on cooling system characteristics are compared in **Soils & Water Resources Table 6**.

Staff has found that capital costs for dry cooling towers tend to be two to three times more expensive than wet systems in general. For hybrid systems that basically require the design and construction of two systems, costs can range from less than to more than dry cooling systems, depending on the systems ration of wet to dry in the design. In general these initial costs differences are due to the heat exchanger unit, size of the structures needed, and the fans and motors needed for a given system.

Calpine/Bechtel considered air-cooled condensers as an option to reduce water demand and address potential salinity related impacts from their wastewater discharge (January 4, 2000, ltr to Eric Rosenblum). Based on their analysis, the Applicant found that use of this dry cooling technology would result in a reduction in water use of 94 percent, but an increase in capital and land costs of approximately \$40 million. Estimates provided by the Applicant are well in excess of those seen in other cases that the Energy Commission has reviewed, and unfortunately, the Applicant did not provide enough details on the cost break-down to allow for meaningful evaluation of potential reasons for these excessive costs. Staff does expect, however, that costs associated with a dry cooling system would be significantly greater than those associated with the wet cooling system, consistent with what has been found in other cases. Calpine/Bechtel argues that dry cooling is infeasible because the air-cooled condensers require more space than is available

SOILS AND WATER RESOURCES Table 6
Qualitative Comparison of
Cooling Tower Environmental Characteristics

Environmental Impact	Wet Cooling	Wet/Dry Cooling	Dry Cooling
Water Supply	Highest supply and treatment requirements	Intermediate supply and treatment requirements	None
Water discharge	Highest discharge and treatment requirements	Intermediate discharge and treatment requirements	None
Plant efficiency/ Fuel supply	Baseline	Lower plant efficiency or higher fuel demand	Lower plant efficiency or higher fuel demand
Plant Emissions	Baseline	Can be higher if additional fuel used	Can be higher if additional fuel used
Auxiliary power requirements	Some	More than wet	Most compared to wet
Secondary emissions	Salt deposition from cooling tower drift	Less salt deposition from cooling tower drift	No secondary emissions
Land requirements	Baseline	Similar to more	Similar to more
Visual impact – Structural	Least obtrusive	Taller structure compared to wet	Taller structure compared to wet
Visual impacts – Plume	Visible plume, function of ambient temperatures	Plume occurrence can be reduced to almost zero	No plume
Noise	Lowest	Can be higher than wet	Can be higher than wet

(HDPP 1998)

at the preferred site. A dry cooling system would also eliminate the benefits associated with MEC's use of recycled water and the reduction of discharges to the South Bay.

ZERO LIQUID DISCHARGE SYSTEMS

Finally, a zero liquid waste discharge system could be installed at MEC. Zero liquid discharge (ZD) systems physically and chemically separate dissolved and suspended solids from the process wastewater resulting in recoverable water and a potentially saleable salt cake byproduct. Recovered water from the ZD system can be recycled back into the plant's water system, thus lowering overall water consumption somewhat compared to a project without the ZD process and maximizing the use of water in the plant's processes.

For example, the proposed Pastoria Energy Facility (PEF; 99-AFC-7) will direct all wastewater, except sanitary and stormwater streams, to a ZD system. The ZD

system will employ a filtration, evaporator/condenser and brine crystallizer. Wastewater streams will be directed to a holding tank (2 million gallons). Wastewater, at 2,000-2,500 ppm TDS, will flow to the evaporator-condenser where approximately 98 percent of the water will be recovered as condensate. PEF's evaporator-condenser will require approximately 1.8 MW at 400 gpm condensate. A highly concentrated brine product (10,000 ppm TDS) will go from the evaporator-condenser to a storage tank with a capacity of 50,000 gallons. A brine crystallizer will recover approximately 1 percent of the wastewater influent (half the brine) as clean condensate. The salt cake will be discharged with a moisture content of 10-15 percent. Approximately 2 to 8 cubic yards of recovered solids are expected (an average of 5 cubic yards). During peak summer operations up to 7 truck trips a week will be needed for removing the product offsite. The resulting salt cake will either be sold or disposed of at an approved landfill. The resulting salt cake is not expected to be hazardous. Water savings of 5-10 percent resulted from increasing cycles of concentration in the cooling towers and recycling recovered water from the ZD system.

Other projects before the Energy Commission are using this and similar technologies to reduce wastewater streams. Three Mountain Power Plant Project (99-AFC-2) is also proposing a ZD system that employs a brine concentrator and crystallizer. This process allows the cycles of concentration to be increased from 7 to 20 and reclaim process water. Blythe Energy Power Plant Project (99-AFC-8) will use a brine concentrator to reduce its wastewater stream prior to discharge to an evaporation pond. This applicant estimated costs associated with the evaporation ponds and treatment equipment is \$7.7 million.

As stated above, the City's current position is that barring a salinity mitigation program, the wastewater from MEC will need to be pre-treated such that the quality of the wastewater prior to discharge is similar to that of the recycled water delivered. If MEC were to treat their wastewater to meet this requirement, it would not make sense to discharge it to the sewer system but, instead, this water could be recycled it into the MEC processes. Although additional space would be required for such a system, zero liquid discharge systems are technically feasible and don't require as much space as a dry cooling system. The salt cake that results from such a system would need to be tested to determine waste disposal requirements.

Although these last two alternative could be incorporated into the MEC and reduce the impacts associated with the facilities wastewater, staff expects that the City, in fact, will take actions to develop an overall salinity mitigation program to ensure the quality of the SBWR recycled water product. Unfortunately, the exact requirements that will be imposed on MEC at the time the final Industrial Wastewater Discharge permit is issued are uncertain at this time. Therefore, staff is recommending a condition of certification that addresses this uncertainty (see **Soils&Water 6**).

NITROGEN DEPOSITION FROM PLANT OPERATION

Concerns were raised by SCVWD and the community regarding the potential NO_x deposition impacts on water resources in the vicinity of the project (for a more complete discussion on the emission associated with MEC's operation, please refer

to the **Air Quality** section of this FSA). Recently two Coyote Valley Subbasin wells south west of the project site were found to have high nitrate concentrations, well above the 45 mg/l drinking water standard (see **Soils and Water Table 1** for groundwater quality data in Coyote Valley). Elevated nitrate levels have occurred in several wells in the Llagas Basin as well. Suspected causes of the high nitrate concentration are agricultural practices and animal and human wastes (septic systems contribute more than 700 acre feet a year to the Coyote Valley Subbasin recharge). SCVWD established a Nitrate Management Program to monitor nitrate levels in water resources in the area and reduce further nitrate loading in the future (SCVWD 1999c).

Calpine/Bechtel analyzed the potential for increases in nitrogen levels in local water bodies as a result of plant operation. This analysis was part of a larger study on the potential for nitrogen loading of surrounding serpentine soils from the proposed plant's NO_x emissions (Calpine/Bechtel 2000c; 2000ii). These soils are important habitat for the Bay checkerspot butterfly, an endangered species. For more discussion on the impacts to serpentine areas, please refer to the **Biological Resources** section of this FSA. Staff completed their review of Calpine/Bechtel's study and also conducted their own evaluation of potential impacts to local water bodies (both surface and ground water) in the vicinity of the project from nitrogen deposition.

Both the Applicant and staff conservatively assume all the nitrogen leaving the plant (4.9 tons-N per year or 1.3 kg/ha/yr) is deposited in the area. Unlike Calpine/Bechtel, staff took the conservative approach that the already elevated nitrate levels in groundwater indicate that soils are nitrate saturated and any additional deposition will be passed through to groundwater. These conditions represent the extreme "worse case" and aren't expected to actually occur. Under these assumptions, staff found that MEC's operation would contribute to an increase in nitrate groundwater and Coyote Creek concentrations of 0.2 mg/l and an increase of 0.4 mg/l in Fisher Creek. For a more detailed discussion of the Staff's assessment on the nitrogen impacts to water bodies, please see Appendix C. Since median dissolved inorganic nitrogen concentrations in Coyote Creek are estimated at 0.7 mg/l (Calpine/Bechtel 2000s; Fisher Creeks is assumed to have similar water quality), an increase of 0.2 mg/l will still be significantly below drinking water standards (45 mg/l). Staff does not anticipate that nitrogen deposition to the creeks will cause a significant adverse impact.

In the extreme "worse case" analyzed, the increase of 0.2 mg/l to groundwater is small, but can not be considered negligible if the system is already nitrogen stressed. SCVWD has already established a Nitrate Management Program focused on monitoring nitrate levels in the Llagas and Coyote Subbasins and reducing loading from major sources such as fertilization and septic systems. Staff suggests that the SCVWD's program provides the most effective means to reduce nitrate concentration in the areas groundwater. In addition, the Applicant is already required to obtain emission offsets for MEC's NO_x emissions to address air quality impacts. Staff does not believe that additional mitigation is required to address impacts to groundwater resources.

CUMULATIVE IMPACTS

Several projects are being proposed in San Jose within the vicinity of the MEC. These projects include the Coyote Valley Research Park (CVRP), several residential developments, manufacturing facilities, and research and development facilities. At this time, the CVRP is the only defined proposal in the area under consideration and, therefore, the only project considered in this cumulative impacts analysis.

A 688-acre campus industrial development, the CVRP will be developed over several years and is expected to employ approximately 20,000 employees. Included in the proposal is a 3.6 million gallon water reservoir and associated water facilities, an approximately 269-acre flood control basin and open space area, and relocation of a portion of Fisher Creek. As proposed, the groundwater needs of the CVRP will be supplied by three existing San Jose MUNI wells (wells 21-23) and a new standby well located north of Bailey Avenue and west of the railroad tracks and Monterey Highway (SJ 2000a, Vol. 1, p. 24). Although the CVRP project is not at this time proposing to use reclaimed water, the project will include a reclaimed water distribution system for eventual use of reclaimed water for landscape irrigation. It is located in the 1,444-acre North Coyote Valley Campus Industrial Area that, at build-out, is expected to employ more than 50,000 people.

In February 2000, the City of San Jose issued their draft Environmental Impact Report (DEIR) on the proposed CVRP (SJ 2000a) and recently published their First Amendment to the EIR (September 2000). In their DEIR on the CVRP, San Jose estimated the water demand for development in Coyote Valley to be 3,000 gpd per acre. Although the CVRP is a total of 688 acres, the City used 400 acres to estimate the total water consumption of the development. Based on these estimates, the CVRP will consume approximately 1.2 mgd (1,344 acre-feet of water a year). This is significantly less than the amount suggested by SCVWD which estimates CVRP's water consumption on the order of 2,800 acre-feet per year.

The City's environmental review found that "sufficient water is available to serve the Project and build-out of North Coyote Valley Campus Industrial Area" without significant impact. When recycled water is available in the Coyote Valley, the City expects CVRP to use it for various nonpotable water needs (SJ 2000a, Vol. 1, p. 188) to help lower the demands placed on potable water supplies but does not actually require the project to do so. As discussed above, staff's assessment showed that CVRP, in fact, has the potential for adverse impacts to flows in Coyote Narrows and Fisher Creek and, thus, MEC would contribute to a cumulative impact. Staff believe that SCVWD's current groundwater management program will address water supply impacts of the new development and additional mitigation is not required.

As described in the DEIR, the San Jose/Santa Clara WPCP has a capacity of 167 mgd and processed approximately 142 mgd of effluent in November 1998. City of San Jose allocated capacity is 106.39 mgd and the City utilized 94 mgd of this capacity as of November 1998 (SJ 2000a, Vol. 1, p. 186-188). As discussed earlier, the WPCP is limited under their NPDES permit to an effluent discharge flow rate to

the Bay of 120 mgd. Expected wastewater flows of approximately 0.9 mgd (1,008 acre-feet per year) represents a one percent increase in the City's existing peak weekly wastewater flow and will utilize more than 15 percent of the City's remaining share of capacity at the WPCP and is considered to be significant. MEC, on the other hand, will actually decrease loads on the WPCP because of its use of recycled water and will be required to mitigate any impacts associated with salinity impacts associated with its wastewater discharge. Therefore, MEC will not contribute to a cumulative impact to the City's sewer system or WPCP.

FACILITY CLOSURE

A planned, unexpected temporary or permanent closure of the proposed MEC should not be a significant concern if the site drainage and erosion are properly dealt with for any potential closure. Unexpected permanent closure may pose the potential for drainage and erosion problems due to a lack of maintenance of the facilities. Staff will require MEC to address this concern in their closure plan.

COMPLIANCE WITH LAWS, ORDINANCES, REGULATIONS AND STANDARDS

To ensure compliance with LORS, Calpine/Bechtel will be required to obtain several permits for the construction and operation of MEC and its related facilities. The proposed project will be required to obtain a Recycled Water Use Permit and the Industrial Waste Discharge Permit from the City of San Jose. Any wells that are constructed to serve the MEC will be required to obtain a permit from the SCVWD. Although the project, as proposed, is not in compliance with a pre-treatment requirement, this may not be the requirement in the final permit issued because the City is pursuing a salt mitigation program. Any discharge limits established by the City will ensure that the project does not result in a violation of the WPCP's NPDES limitations.

Permits required for construction of the detention basin outfall to Fisher Creek include a Streambed Alteration Agreement from the Department of Fish and Game, a U.S. Army Corp of Engineers Nationwide Permit 7 and water quality certification (Section 401) from the SFBRWQCB. Staff is also recommending that the Applicant obtain approval from SCVWD for work within the floodways and adjacent to the creeks. For further discussion of the project's compliance with the Streambed Alteration Agreement and the Nationwide Permit, please see the **Biological Resources** section of this FSA.

Construction and operation of the MEC will comply with the requirements of the SFBRWQCB's general NPDES surface water discharge permits. Included in these requirements are provisions for spill prevention and response measures, source control, monitoring and sampling specifications and employee training (SFRWQCB 1993).

COMPLIANCE WITH SWRCB 75-58

SWRCB Policy 75-58 states that the source of power plant cooling water should come from the following sources in order of priority:

1. Wastewater being discharged to the ocean.
2. Ocean water.
3. Brackish water from natural sources or irrigation returns flow.
4. Inland wastewaters of low total dissolved solids.
5. Other inland waters.

Clearly, MEC's use of the SBWR recycled water product, which would otherwise be wastewater discharged to the ocean, satisfies SWRCB's Policy 75-58.

MITIGATION

EROSION AND SEDIMENTATION

Construction of MEC will increase surface grade, result in significant land disturbance and permanently alter surface drainage patterns in the project area. In response to a staff data request, MEC provided a revised draft Erosion Control and Revegetation Plan that described some of the temporary and permanent erosion and sedimentation control measures to be employed at MEC (Calpine/Bechtel 2000b; 1999q, Data Response BR-155, revisions to WR-147; 2000o, Data Response 155R2). Calpine/Bechtel also submitted a revised draft Stormwater Pollution Prevention Plan (SWPPP) that identifies the stormwater conveyance system and monitoring program (Calpine/Bechtel 1999q, Data Response BR 156, revisions to WR-149; 2000h; 2000m Data Response 1K, WR-147R3). As identified in the revised draft, anticipated best management practices (BMPs) that will be employed include:

- Most land disturbance construction will occur during the summer, dry months .
- Vegetate diversion ditches.
- Revegetation and mulching of disturbed areas.
- Temporary structures such as straw bale dikes, silt fences and sandbag dikes to re-direct runoff, decrease flow velocities, capture sediments and stabilize exposed soils.
- Conduct regular inspections, maintenance and monitoring.
- Utilize a sedimentation basin to collect runoff.
- Wetting of exposed soils during construction, restricting speeds in construction areas.
- Employ slope protection systems.

Also, Calpine/Bechtel proposes to horizontally directional drill to place a 1,000 foot segment of the natural gas pipeline under the Union Pacific Railroad tracks, Monterey Highway and Coyote Creek. A draft Streambed Alteration Agreement

(Calpine/Bechtel 2000q) provided additional information on needed actions to reduce erosion-related impacts along the creeks and measures (i.e., monitoring and soil analysis) that will be taken to avoid leakage of non-toxic drilling mud into Coyote Creek ("frac-out"). If such a leak does occur, the plan calls for isolation of the leaked fluids and repair of the fracture. Staff has reviewed these drafts and believes the plans, if properly implemented will provide adequate protections to water quality. Final plans will identify the specific best management practices (see Appendix D) that will be implemented at the site to prevent loss of soil and prevent erosion-related pollution and incorporate necessary measures as specified in the Streambed Alteration Agreement, Nationwide Permit and 401 Certification. When finalized, this plan will serve as the SWPPP as required under the General Construction Stormwater Permit issued by the State Water Resources Control Board.

SPILL PREVENTION

Various hazardous materials and chemicals will be used at the MEC. As proposed Calpine/Bechtel will store chemicals above ground in designated areas. A site spill contingency plan will need to be developed for chemical spill control and management of the hazardous materials that will be stored and used on the site (please see the **Hazardous Materials Management** section of this FSA for more information), particularly since the project is directly over the Coyote Valley subbasin, a source of drinking water for the area. Chemical storage and feed areas will be designed per SCVWD and SFRWQCB requirements to contain leaks and spills. A revised draft construction SWPPP was submitted that provided a general outline of spill prevention and controls (Calpine/Bechtel 2000h, Data Response Set 1J, WR-147R1; 2000m, Data Response Set 1K, WR-147R3). As part of their draft spill prevention and containment plan, Calpine/Bechtel proposes to build containment structures (berms) for the storage areas. The containment structures will be sized to hold the volume in the largest tank or container plus the volume of rainfall from a 25-year, 24-hour storm event. Areas in which more than one vessel is to be located will be designed to contain 150 percent of the volume from the largest tank (Calpine/Bechtel 1999q, Data Response BR-156). Construction equipment refueling will be prohibited within 100 feet of waterways. Major construction equipment cleaning and maintenance will be done in an area where runoff can not migrate to Fisher or Coyote Creek (Calpine/Bechtel 2000q BR-155R). The Applicant will also employ monitoring programs and train employees in spill response (Calpine/Bechtel 2000q IWD Application).

A specific plan will be required as part of the NPDES surface water discharge permit that describes material handling, storage practices, clean-up actions, equipment, training and reporting (SFRWQCB 1993). At this time, staff is recommending a condition of certification to ensure Calpine/Bechtel provides a site-specific spill prevention and contingency plan that will comply with SCVWD and the SFRWQCB requirements.

SITE DRAINAGE

The site drainage system will be designed to comply with all applicable federal, state, and local regulations. On-site drainage will be accomplished by gravity flow,

whenever possible (Calpine/Bechtel 2000d). The surface drainage system will consist of mild slopes (greater than or equal to 1%) and open channels, catch basins and a drainage pipe system, sedimentation detention basin, swales and a vegetated ditch. Calpine/Bechtel have specified that site base elevation will be 255 feet above msl (Calpine/Bechtel 1999q) and the ground floor elevation of buildings and structures will be placed above the 100-year flood level of 247 feet. Design of the site drainage facilities will be performed in accordance with the City of San Jose and SCVWD requirements. As described earlier, site drainage will be designed to ensure that post-development storm flows do not exceed pre-development flows. The unlined stormwater detention basin will be sized for the 10 year and 100 year, 24 hour storm events (Calpine/Bechtel 1999 h; 2000j).

CEC STAFF PROPOSED MITIGATION

Energy Commission staff has examined the mitigation measures proposed by the Applicant. Staff recommends additional measures in the form of conditions of certification to assure compliance with applicable LORS, avoid degradation of water quality, minimize erosion and sedimentation and not adversely impact water quality. Together the Applicant's proposed mitigation measures and the staff's recommended conditions of certification will adequately assure that no significant environmental impacts to soil or water resources will result from the construction and operation of MEC.

RESPONSE TO PUBLIC AND AGENCY COMMENTS

Several comments were received from the public and agencies on the Preliminary Staff Assessment. Below is a listing of those questions and staff's responses that specifically concern the topics discussed in this Soils and Water Resources assessment. Additionally, intervenor and Applicant soils and water-related comments have been considered in the analysis, where appropriate. Since intervenors and the Applicant are a formal party to this proceeding, staff has not included a copy of their comments in the FSA.

DEPARTMENT OF PLANNING, CITY OF SAN JOSE

On July 5, 2000, the City of San Jose's Department of Planning, Building and Code Enforcement filed comments on Staff's PSA. Staff's response are provided:

SJ-1: Environmental Services Department (ESD) is still in negotiations with the Applicant regarding the salt mitigation issue. ESD is considering having Calpine/Bechtel disburse salt mitigation fees and is also in the process of developing a local ordinance for salt mitigation. We will provide additional information to the CEC under separate cover when this issue is resolved.

Response: Staff appreciates the information submitted by the City regarding the salt mitigation of the MEC wastewater discharge and has incorporated this information accordingly in our analysis.

SJ-2: Greater use of South Bay Water Recycling water could be made through dual plumbing of the facility, thus further reducing the potable water demand and still remaining under the maximum deliverable by SBWR.

*Response: Staff agrees and has included this in our recommended condition of certifications (see **Soils&Water 1**).*

SJ-3: On page 392 of the PSA, the flow is listed as 134 million gallons per day (MGD). The correct volume for 1998 models should be 133 MGD since this figure represents the mean effluent flow.

Response: Correction made.

SJ-4: The City of San Jose concurs with the CEC on the need for further analysis of the Metcalf Energy Center's potential impacts on groundwater sources in the Coyote Valley. The San Jose Municipal Water Company has indicated that additional analysis is needed in the PSA to address the following questions:

What is the impact of potential transfers from the Coyote Basin to the Santa Teresa Basin on the Coyote Valley water supply budget?

What is the impact of potential transfers from the Santa Teresa Basin to the Coyote Basin on both the Santa Teresa Basin and the Coyote Basin and the potential for redirecting any contaminated groundwater plumes in the area?

Response: Additional analysis was conducted and the results presented in this assessment. Please refer to Appendix C – Testimony of Dominique Brocard.

SANTA CLARA VALLEY CHAPTER, CALIFORNIA NATIVE PLANT SOCIETY, LIBBY LUCAS

Staff received several comments from Libby Lucas representing the California Native Plant Society, some of which concerned soils and water resources (June 27, 2000). These comments and staff responses are as follows:

NPS-1: "The proposed plant location at the confluence of Fisher Creek and Coyote Creek is immediately upstream of the Tulare Hill Narrows where Coyote Valley groundwater and Coyote Creek base flows rapidly percolate into the deep aquifers of Santa Clara Valley. These are the aquifers that provide drinking water for the Valley and for the City of San Jose. This is a critical resources and the Coyote Creek percolation ponds and the Coyote Valley groundwater are critical receptors. See Exhibit A, Areas favorable for groundwater recharge..."

Response: Comment acknowledged.

NPS-2: "This 14 acre MEC site is at the tip of what one might call a near-surface aquifer. The depth to first water is 0 to 5 feet as shown in Figure 2 of the December 1999 publication of the Santa Clara Valley Water District, 'An Analysis of the Sensitivity to Contamination of the Santa Clara Valley Groundwater

Aquifers Based on USEPA Drastic Methodology'. See Exhibit B. This is in conflict with your water resources testimony of groundwater levels at 12 feet, in 6-20 workshop."

Response: As was discussed in the staff's PSA and is again included in this assessment, groundwater levels in the northern Coyote Basin are at times at ground surface.

NPS-9: Regarding project's compliance with EPA guidelines on Wellhead Protection

Response: The state agency responsible for the implementation of the EPA Wellhead Protection Program is Department of Health Services. According to Leah Walker at DHS, the program is predominately geared towards inventorying sources of drinking water in the state and identifying potential sources of contamination. The program does not have any specific requirements or restriction on new development. Staff has also contacted other agencies to determine if their regulations or approvals would result in additional restrictions under the Wellhead Protection Act to MEC. According to Will Bruhns of the SFRWQCB and Luis Jimenez of the SCVWD, California's Drinking Water Source Assessment and Protection Program has not resulted in any new actions or standards that new development must take in addition to those already enforced.

NPS-9b: Regarding discharge or accidental release of "salty" waste recycled water into the creeks.

Response: As proposed, the MEC will utilize a closed loop system of recycled water deliver and return to the City sewer system. No recycled water will be intentionally discharge to creeks. In terms of accidental releases or leaks from the wastewater discharge system prior to delivery to the City of San Jose's sewer system, repairs and clean-up will be required as for any other user of recycled water and wastewater discharger in San Jose. Impacts from such an accidental release will be temporary and should not require any special mitigation.

SUE SWACKHAMER

Staff received comments from Sue Swackhamer dated June 23, 2000. Staff has acknowledged Ms. Swackhamer's editorial comments and provides response to her more substantive comments below:

SS-2: "The first sentence on Page 389 clearly describes the responsibilities of SCVWD. The statement on Page 285 is misleading to anyone just reading the summary. According to the SCVWD literature, such as "Facts about SCVWD," the SCVWD is the "water resources management agency serving the wholesale water supply and flood protection needs of Santa Clara County." This is more than controls surface water (page 385)...The SCVWD web page states that the Santa Clara Valley Water District is a special district responsible for water supply and flood management in Santa Clara County."

Response: Comment acknowledged. See more indepth discussion on SCVWD in the Environmental Setting section.

SS-5: “The FSA should include the results of test pumping of Wells 21-23 simultaneously to see whether or not the pumping is adequate. Because both Calpine and CISCO plan to pump water from the same wells, additional supplies if necessary, preferably wells in a different water basin, should be described in the FSA.”

Response: Calpine/Bechtel are no longer proposing to utilize MUNI wells 21-23. Rather, the Applicant is proposing to build at least two new wells in north Coyote Valley that will use groundwater from the Coyote Basin. The location of these wells were identified in the Applicant groundwater analysis of Coyote Basin and the groundwater supply system report discussed in this assessment.

SS-7 & 8: Requests that Soils&Water condition and verification be strengthened and suggested language to do so.

Response: Staff considered recommendation and modified the conditions of certification.

SS-9: “Does Calpine pay for landowners to deepen their wells if Calpine pumps so much groundwater that the water table drops?”

Response: As discussed above, although groundwater drawdown attributable to MEC’s operation may effect some adjacent wells, this impact is not considered a significant and will not require mitigation.

CONCLUSIONS

Staff’s assessment of the proposed MEC concludes that use of SBWR recycled water will not contribute to a project specific or cumulative significant adverse impact to recycle water supplies. Although staff’s analysis concluded that the MEC wastewater has the potential to degrade the SBWR recycled water product, staff does not consider this a significant environmental impact as defined under CEQA. At this time, specific mitigation that will be required as a condition of the City of San Jose’s Industrial Wastewater Discharge Permit to protect the SBWR recycled water quality is uncertain, but will be determined prior to MEC’s operation. Staff determined that groundwater extraction to serve MEC from Coyote Valley Subbasin will result in potentially significant reduction in flows from Coyote Narrows into Santa Clara Valley Subbasin that can be managed by SCVWD’s current groundwater management program. Applicant proposed mitigation and staff’s recommended conditions of certification address these potential impacts. Staff, thus, concludes that the proposed MEC will not result in any unmitigated significant adverse impacts to the area of soil and water resources, and recommends adoption of the proposed mitigation and conditions of certification.

CONDITIONS OF CERTIFICATION

SOILS&WATER 1: Disinfected, tertiary-treated, recycled water will be used at the Metcalf Energy Center for cooling purposes and other appropriate non-potable uses (i.e., toilet flushing and equipment washing). Potable water may be used for cooling purposes only in the event that SBWR recycled water service is interrupted, but not to exceed 45 days in any one year. The project owner will notify the CPM in writing if potable water is used for cooling purposes and provide an explanation of why the back-up supplies are being used.

Verification: Once construction of the MEC facility is complete, the project owner will provide the Energy Commission CPM with a copy of a valid Recycled Water Use Permit from the City of San Jose. The project owner will design and install dual plumbing such that recycled water will be used to supply appropriate non-potable uses (i.e., cooling process, toilet flushing and equipment washing).

In the monthly and annual compliance report, the project owner will provide a record of water consumption for MEC. Included in this record the project owner will identify the required quantities of recycled and potable water broken down by type of use (domestic, steam cycle cooling). In the event that recycled water is interrupted for more than 45 days in one year, the MEC will cease operation until a suitable alternative is approved by the CPM.

SOILS&WATER 2: Prior to beginning any clearing, grading or excavation activities associated with construction of any project element, the project owner shall obtain Energy Commission staff approval for a Storm Water Pollution Prevention Plan (SWPPP) as required under the General Stormwater Construction Activity Permit from the SFBRWQCB for the project.

Verification: Thirty days prior to the start of any clearing, grading or excavation activities associated with the construction of any project element, the project owner will submit a copy of the Storm Water Pollution Prevention Plan (SWPPP) to the Energy Commission Compliance Project Manager (CPM) for review and approval. Approval of the plan by the Energy Commission CPM must be received prior to the initiation of any clearing, grading or excavation activities associated with construction of any project element.

SOILS&WATER 3: Prior to beginning any clearing, grading or excavation activities associated with construction of any project element, the project owner shall obtain staff approval for a final erosion control and revegetation plan that addresses all project elements. The final plan to be submitted for staff's approval shall contain all the elements of the draft plan with changes made to address any staff comments and the final design of the project.

Verification: The erosion control and revegetation plan shall be submitted to the Energy Commission CPM no later than thirty days prior to the scheduled construction start date. Approval of the final plan by the Energy Commission CPM

must be received prior to the initiation of any clearing, grading or excavation activities associated with construction of any project element.

SOILS&WATER 4: Prior to beginning any clearing, grading or excavation activities associated with construction of any project element, the project owner shall obtain SCVWD approval for all activities within floodways or upon or within the banks of watercourses as defined in District Ordinance 83-2.

Verification: Thirty days prior to the start of any clearing, grading or excavation activities associated with the construction of any project element, the project owner will obtain SCVWD approval for all activities within floodways or upon or within the banks of watercourses as defined in District Ordinance 83-2 and written documentation of this approval shall be submit to the Energy Commission Compliance Project Manager (CPM).

SOIL&WATER 5: No later than sixty days prior to commercial operation, the project owner, as required under the General Industrial Activity Storm Water Permit from the SFBRWQCB, the project owner will develop and implement a Storm Water Pollution Prevention Plan (SWPPP). Approval for the final Industrial Activities SWPPP must be obtained from Energy Commission staff prior to commercial operation of the power plant.

Verification: Two weeks prior to the start of commercial operation, the project owner will submit to the Energy Commission CPM a copy of the Storm Water Pollution Prevention Plan (SWPPP) prepared under requirements of the General Industrial Activity Storm Water Permit. The final plan shall contain all the elements of the draft plan with changes made to address staff comments and the final design of the project.

SOILS&WATER 6: The project owner shall obtain an Industrial Discharge Permit from the City of San Jose Environmental Services Division prior to discharging of the project's wastewater discharge to the City of San Jose sewer system and comply with all restrictions and conditions imposed therein.

Verification: No fewer than 45 days prior to commercial operation, the project owner shall provide the Energy Commission CPM a copy of a valid Industrial Discharge Permit including any pretreatment requirements and/or limitations. The project owner shall notify the Energy Commission CPM in writing of any changes to and/or renewal of the permit.

SOIL&WATER 7: Prior to the initiation of any clearing, grading or excavation activities associated with any project element, the project owner shall obtain a Section 401 Certification from the San Francisco RWQCB.

Verification: No later than 30 days prior to the start of any clearing, grading or excavation activities associated with any project element, the project owner shall

submit to the Energy Commission CPM a copy of the Section 401 Certification from the San Francisco RWQCB for the MEC.

SOIL&WATER 8: The project owner shall only use groundwater for MEC process and domestic requirements and, as provided in Soil&Water 1 above, for back-up cooling make-up from the two wells and pipelines as specified in the Groundwater Supply System report (Calpine/Bechtel 2000q). The project owner shall notify the Energy Commission when these wells are installed and submit the results of the pump tests to determine well capacity.

Verification: No later than 30 days prior to the start of any clearing, grading, excavation or drilling activities associated with the construction of potable water system as described in the Groundwater Supply System report (Calpine/Bechtel 2000q) needed to serve MEC, the project owner shall submit the following to the Energy Commission CPM:

- all construction specifications for the proposed wells
- a copy of the valid well permit(s) and registration numbers for the wells to be constructed
- any construction or operation conditions imposed by the SCVWD.

No later than 30 days after the completion of the wells, the project owner shall notify the CPM that the wells have been installed and submit the results of the pump and aquifer tests conducted.

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APPENDIX A: WATER BALANCE

APPENDIX B: COOLING TECHNOLOGY COMPARISONS

INTRODUCTION

Information provided in this appendix is offered as background in support of discussions made in the main text on the topic of dry cooling. Alternative cooling technologies, such as dry or wet/dry (hybrid), are technically feasible for application at power generation facilities for heat rejection. A comparison of the dry, hybrid and wet cooling alternatives ultimately depends on the specific needs of the proposed project and the potential for the various alternatives to pose adverse environmental or economic impacts. Dry and hybrid (wet/dry) cooling systems are occasionally used because they use significantly less water (greater than 90 percent less) and reduce the occurrence of visible plumes as compared to conventional wet systems. Dry and hybrid cooling systems are, however, less efficient in rejecting heat, and generally have higher parasitic (fan) electrical loads and can create a higher pressure (temperature) in the steam turbine condenser (Burns 1995). Both of these factors decrease the thermal efficiency and power output of the plant. In addition, capital costs of dry cooling towers, including ancillary systems, may cost two to four times that of a wet cooling tower.

This section describes some of the commercially and technically feasible cooling technologies available to power plant developers, and some of the tradeoffs between the technologies. Dry and hybrid cooling technologies are very effective in reducing water use and visible plume formation. There are numerous site, design, construction and operational variables that would affect the initial, operating, and maintenance costs of the cooling technologies and project, and the production costs from the facility. These options also make it difficult to specify how the project would change if an alternate cooling tower technology were used.

TECHNOLOGY DESCRIPTIONS

Historically, power plants have used once-through cooling to reject heat directly to an adjacent body of water. With increasing concerns over thermal pollution and conjunctive water uses, cooling towers have become more common, either as an intermediary step to cool the water prior to being returned to the body of water, or to reject the heat directly to the atmosphere.

Cooling towers reject heat from a power plant's steam (rankine) cycle to condense the steam exiting the steam turbine and to maintain the lowest possible condenser vacuum, and thus, improve the power plant energy efficiency. The heat rejection mechanism in wet cooling towers is primarily the evaporation of water to the atmosphere. Dry cooling towers transfer sensible heat through heat exchangers, while wet/dry hybrid cooling towers use combinations of the two mechanisms to reject heat to the atmosphere. Cooling towers use forced or induced draft to move ambient air, and pumps to move water through the tower. The ambient air temperature, humidity, and air and water mass flow rates affect the heat transfer rate and, ultimately, the efficiency of the cooling tower. The cooling tower heat

rejection efficiency and pump and fan loading affect the overall power plant thermal efficiency and output.

The technology descriptions below are for the most commonly used cooling tower designs. There are variations to these designs, and many other unique and technically feasible designs that are available to power plant designers, the specifics of which are not described here.

WET COOLING TOWERS

Wet cooling tower systems circulate a large volume of cooling water through the steam condenser to reject heat from the steam cycle. The circulating water passed through the condenser and then is sent to the cooling tower. In the cooling tower heat is rejected to the atmosphere through evaporation. Circulating cooling water losses are to evaporation, drift, and blow-down, which requires make-up water to be added to the system. Contaminants are concentrated in the circulating cooling water as water is evaporated. Additional contaminants are introduced into the circulating cooling water as the air and water are mixed in the cooling tower. Ancillary systems are used to control biological growth and adjust the chemical composition as water is lost and added.

Large fans are used to move air counter to the water flow to facilitate the evaporation process. However, natural draft tower designs can also be used to move the air through the tower. The air exits the tower warmer than the ambient air. The warm air rises as a plume, and can become visible if the moisture in the plume condenses into visible droplets (i.e., cloud formation). The towers are designed to uniformly distribute the hot water across the top of the tower and break the flow into small droplets or thin films. The evaporation process occurs as the water cascades down through a torturous path that maximizes air/water mixing. The cooled water is collected in a sump, augmented with make-up water, and returned to the condenser. Drift eliminators control the amount of water droplets that escape out the top of the tower. Minimizing drift is important to reduce water losses, maximize heat rejection, and reduce visible plume occurrences. Drift escaping the cooling tower is unrealized cooling and wasted water.

Wet cooling tower performance is a function of the wet bulb and the approach temperatures. Wet-bulb is the air temperature that would result if ambient air were saturated (to 100% humidity) with water; dry-bulb is the ambient temperature. Wet-bulb temperature is less than or equal to dry-bulb temperature, depending on the starting humidity of the ambient air. Wet cooling is more effective than dry cooling in dry low-humidity areas.

The approach temperature is the difference between the temperature of the cold water exiting the cooling tower and the air temperature (wet bulb for a wet cooling tower) entering the cooling tower. While it would be desirable to design to achieve an approach of zero, in reality, 6 to 10 °F is the most cost effective and common for mechanical draft wet cooling towers (Burns 1995). Lower approach temperatures can be designed for with a larger heat transfer surface area (a bigger tower to

spread out water flows), a longer residence time, or higher air flows, all at higher initial or operating costs.

DRY COOLING TOWERS

DIRECT DRY COOLING

In the direct dry cooling system, steam exhausts from the turbine to a manifold radiator system. The steam condenses in the radiator system as heat is conducted through the pipe walls to the atmosphere. Often the piping is finned on the airside to increase the heat transfer surface area and rate. In mechanical draft systems, fans move air through the radiator to enhance heat transfer.

Because the steam is condensed directly in the radiator system, and is returned to the boiler as feed water, direct dry cooling does not have a huge volume of circulating cooling water. The closed system does not experience water losses due to evaporation. Additionally, without evaporation, the cooling water system does not become concentrated with salts and impurities, requiring additional losses through a blow-down stream. Therefore, dry cooling does not require the large volumes of make-up water that are necessary in wet cooling systems. Nor does it require ancillary systems to control biological growths, and control water chemistry to the degree that a wet cooling tower does (the steam/boiler water chemistry would still need to be monitored).

The amount of cooling that can be achieved is related to the dry-bulb temperature of the ambient air and the approach temperature. Dry bulb temperature is the measured temperature of the air, regardless of humidity. The approach temperature is the difference between the cold water (exiting the cooling tower) temperature and the air temperature (dry bulb for a dry cooling tower) entering the cooling tower. Approach temperatures in the range of 35 to 60 °F are generally available for dry cooling towers (Ortega 1995 and Hutton 1997), with 35 to 40 °F considered a relatively small approach temperature (Bonger 1995). If a process requires an approach temperature below 30 to 40 °F, in the range of 20 °F, designers generally recommend wet cooling towers (Bukowski 1995). The lower approach temperatures can be achieved through a larger heat transfer surface area, a longer residence time, or higher air flows.

The larger volume of steam-containing piping, relative to a wet system steam condenser, and the associated seals, valves, flanges, etc., offers more opportunities for oxygen ingress due to the vacuum created during the condensing process. Increasing oxygen content in the boiler water generally leads to increasing corrosion; additional boiler water treatment/deaerators would be required to control oxygen.

INDIRECT DRY COOLING

An indirect dry cooling system uses a secondary working fluid to transfer the heat from the steam cycle to the atmosphere. In the indirect cooling system, a closed cycle system extracts heat from the condenser and rejects the heat through a radiator system. The secondary working fluid can be water, ammonia, or a

fluid/mixture with heat transfer and properties suited to the temperatures and heat transfer regime.

The performance of the indirect dry cooling tower is still a function of the dry bulb temperature. Pumps are required to move the working fluid through the condenser and radiator system. For those indirect dry systems using water, the initial fill of the circulating system requires treated water. Since the fluid is not evaporated or exposed to ambient air, extensive biological and water chemistry systems are not required.

WET/DRY HYBRID COOLING TOWERS

Wet/dry hybrid cooling towers use both an evaporative system and a radiator system to reject heat from the condenser. The ratio of dry to wet depends on the ambient conditions and the desired heat rejection, water savings, or visible plume reductions. Because the dry radiator system rejects heats into the air moving through the tower without adding moisture, it is often used in series or parallel with the wet portion to control visible plume formation. The key to the hybrid system is controlling the two systems to achieve the desired heat rejection (operational constraints), visible plume reduction, and/or water savings while balancing pump and fan loads.

In a series configuration, a wet/dry hybrid cooling tower evaporative section rejects heat by evaporating moisture into the air to levels approaching saturation. If this saturated, or near saturated, air were immediately rejected into the environment, the warm plume would rise, and become visible as the moisture in the plume cooled and condensed. By arranging the tower in series, the dry radiator section rejects additional heat into the saturated air stream without adding additional moisture. The air stream then exits the tower at a higher temperature and lower relative humidity, compared to a wet system, which will take longer to cool to the point of condensing. This additional time can allow the plume to dissipate before a visible plume has time to form.

In a parallel configuration, the heat rejection mode depends on the meteorological conditions. Cool ambient air temperatures, that generally promote visible plume formation, are also those conditions that improve the heat rejection effectiveness of dry cooling system. Visible plumes are less likely to form during warmer ambient air temperatures. Warmer air can hold more moisture, thereby improving the cooling potential from the evaporative wet cooling tower. The control logic balances the ambient conditions and plume control with the desired cooling system performance by rejecting heat in both towers, at some ratio, or in one tower exclusively.

COST COMPARISONS

Staff has compared the use of dry and hybrid systems in other cases before the Commission in which wet cooling systems were the preferred option. Cost differences may vary from project to project depending upon the aspects of the project considered (needed infrastructure, equipment needs, parasitic losses, water and waste related costs, site characteristics, operational constraints and costs of mitigation) in the comparison. Use of a dry cooling system in the High Desert

Power Project was estimated to be two times that of a wet system (\$10-20 million). For the San Francisco Energy Project, the applicant estimated that dry cooling would cost 2 to 3 times that of the proposed hybrid system. In these cases, staff confirmed with cooling tower vendors that these estimates were reasonable and were consistent with cost trends (Matt Layton, HDPP testimony, 1998).

Some applicants have overcome issues related to cost and performance losses between cooling systems where problems or concerns regarding water supply, quality or waste discharges exist. Calpine Corporation switched to a dry cooling system for the recently certified Sutter Power Plant project in response to concerns over potential water-related impacts. This project change resulted in a 95 percent reduction in water demand and an initial cost increase of \$20 to \$25 million for the project (less than 10 percent of the total estimated project cost). As part of their original proposal, the applicant for Otay Mesa Generating Project are proposing the use of dry cooling to address a variety of concerns. In those cases where dry and hybrid cooling technologies are to be employed or are being proposed, it is the result of actions taken by the applicants, not those imposed by the Commission.

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APPENDIX C: TESTIMONY OF DOMINIQUE BROCARD

IMPACTS TO GROUNDWATER REGIME

APPROACH

To evaluate impacts to the groundwater regime in Coyote Valley, the Applicant used a groundwater model based on the MicroFEM computer code (Calpine/Bechtel, 2000). This code solves the groundwater flow equations using the finite elements method. The code is available to the scientific/engineering community through Scientific Software Group, and it has been applied to several modeling projects by CH2M-Hill. Based on a review of model capabilities, the MicroFEM code is believed to be an appropriate tool to evaluate impacts to the Coyote Valley groundwater regime. At the request of the Santa Clara Valley Water District, the MicroFEM model was converted to MODFLOW and results are reportedly comparable (although an actual comparison of model results was not provided).

The MicroFEM model developed for the Coyote Valley assessment included 4 layers, 3 in the alluvium (unconsolidated sand, silt and gravel) and 1 in the underlying Santa Clara Formation (semi consolidated silt, clay and sand), with a total of 8,256 elements. This coverage is suitable for this application. The primary model parameters and their sources are reviewed below:

- Aquifer bottom elevations were based on published information derived from boring logs (McCloskey and Finnemore, 1996).
- Hydraulic conductivities were based on 11 aquifer pumping tests and 45 specific capacity tests (McCloskey and Finnemore, 1996). These data were krieged to provide coverage over the entire basin. The krieging procedure, which is entirely mathematical, has the disadvantage of not using geological interpretation. As a result the conductivity patterns exhibit target-like shapes centered on the measurement points, which are not geologically rational. Nevertheless, the conductivity values are reasonable and, given calibration, they should provide a suitable model. A sensitivity study in which hydraulic conductivities were changed by 20% was conducted and the calibration results were not significantly altered.
- Creek discharge/recharge, Q , is proportional to the stream bed surface area, A , and the difference between the stream stage, z_s , and the local water table elevation, z_{WT} , i.e. $Q = A (z_s - z_{WT}) / R$, except when the water table is at or below the bottom of the stream, in which case the stream recharge becomes independent of the water table elevation. The parameter R describes the stream bed resistance to flow (conceptually, $R = \text{stream bed thickness divided by conductivity}$) and this parameter is difficult to accurately estimate. R was determined from model calibration. A sensitivity analysis was conducted by doubling R , and calculated groundwater levels were generally too low. This indicates that the value used is reasonable, and also that the groundwater levels in Coyote Valley are very much controlled by creek recharge (from

Coyote Creek). A limitation in the modeling conducted is that the creek stages were specified rather than calculated based on the flow in the creek (as can be done in MODFLOW with the STREAM package). As a result, impact of different scenarios on stream flows are somewhat approximate. In general, keeping fixed creek stage will tend to over estimate impacts. For example, if a scenario leads to a reduction of groundwater discharge to a creek, the water level in the creek will drop which will encourage more groundwater to discharge to the creek.

- Rainfall recharge was estimated using Grunsky's Rule, which dates back to 1895. A weakness of this method is that it is based on annual groundwater recharge and, thus does not account for seasonal variations of potential evapotranspiration. For example, a given amount of rainfall in July will yield less recharge than the same amount in January. More sophisticated methods have been developed since; nevertheless the order of magnitude is expected to be approximately correct.
- The model was calibrated to steady state average groundwater levels (represented by the June 1996 conditions) and transient conditions (represented by the 1987-1999 period). In general, the model calibration is satisfactory, although the magnitude of the predicted groundwater variations are less than measured. This may be due to the 6-month time step used to specify recharge and other aquifer stresses, and to the relatively crude method used to estimate recharge. In particular, model predictions of low groundwater levels are more than 10 ft higher than measurements at several wells (see for example Figure 5-15 of groundwater model report). A potential concern with this discrepancy would be that drawdowns due to groundwater withdrawals could be underpredicted.

Some basic results of the model for current conditions are summarized in Table 1 under Scenario 1. This table is based on the Coyote valley Groundwater Report (Calpine/Bechtel, 2000-a, Table 5-5) and Informal Data Requests and Responses (Calpine/Bechtel, 2000-b, Table B).

SOILS AND WATER RESOURCES APPENDIX C Table 1
Groundwater Model Scenarios and Results ⁽¹⁾

	Scenario 1	Scenario 2	Scenario 3	Scenario 4
MEC withdrawal ⁽¹⁾	0	0	Jan: 3,774 Feb-Dec: 686	Jan: 3,774 Feb-Dec: 686
CVRP withdrawal	0	2,800	0	1,680
Annual Narrows LTD ⁽²⁾ Outflow Ave ⁽³⁾	5,932 3,554	4,210 3,407	5,629 3,526	4,452 3,085
Annual LTD Evapotranspiration Ave	252 1,620	26 1,341	203 1,558	43 1,026
Annual net LTD stream seepage Ave	10,512 8,552	11,193 10,923	10,812 9,055	11,193 13,680

⁽¹⁾ All flows in AF/year

⁽²⁾ LTD = long term drought

⁽³⁾ Ave = average conditions, characterized by June 1996

According to the model, evapotranspiration is considerably smaller (by a factor of 6 to 50) for the long term drought than for average conditions. This is because, in the model, evapotranspiration varies from the pan evaporation rate where the groundwater is exposed, to zero when the water table is 6 ft or more below ground level. Thus, lower groundwater levels result in a decrease of evapotranspiration. However, outflow through the Narrows is substantially greater for drought conditions than for average conditions. This is because the groundwater levels specified as boundary conditions at the Narrows are low, reflecting conditions in Santa Clara Valley. However, these groundwater water levels are based on an extrapolation of data ending in 1978. Thus, some uncertainty remains, and the model simulation of evapotranspiration may be somewhat inaccurate. This aspect is relevant to the MEC/CVRP evaluation, since the model is used to characterize the impact of lowering the water table to supply these projects.

RESULTS

Four scenarios were investigated, with conditions and results summarized in Table 1. Scenario 1 corresponds to existing conditions, while the three other scenarios involve groundwater withdrawals by MEC and the proposed Coyote Valley Research Park (CVRP), separately and together. Following are comments on these results.

Groundwater abstraction for MEC and/or CVRP results in a localized lowering of the water table, which in turn reduces evapotranspiration, reduces outflow at the Narrows and increases stream seepage to the aquifer (with an equal reduction in stream flow). It was suggested above that the model may overpredict the effect of water table lowering on evapotranspiration. However, the predicted *reduction* of evapotranspiration due to the projects is generally small and this modeling issue may not be significant here.

The model indicates that the flow needs of the MEC and CVRP projects are primarily supplied by a reduction in Narrows outflow during drought conditions and by increased stream seepage (and equal stream flow reduction) during average conditions. These two impacts are reviewed separately below.

IMPACTS ON NARROWS OUTFLOW

Groundwater outflow at the Narrows plays a role in the groundwater balance of the northern Santa Clara Valley, which has experienced significant land subsidence in the past due to excessive groundwater withdrawals (USGS, 1998). Reduction in Narrows outflow would be considerably delayed relative to the withdrawal, so that annual values are appropriate, even for the MEC withdrawals, which are concentrated in time. Then, the model indicates that MEC withdrawals have a relatively small impact on Narrows outflow for both drought and average conditions. CVRP, on the other hand has a significant impact during droughts (29% reduction if alone, 25% in conjunction with MEC), but a negligible impact during average conditions. In absolute terms, this outflow reduction is about 1,700 AF/yr, which is a relatively small fraction of the 150,000 AF/yr groundwater abstraction in Santa Clara Valley (Iwamura, 1995), but the effect can become significant in the long term. This outflow reduction can be mitigated by additional water recharge to the aquifer.

IMPACT ON CREEK FLOWS

MEC and/or CVRP abstractions will reduce flows in both in Coyote Creek and Fisher Creek by directly drawing water out of the creeks or reducing groundwater discharge to the creeks. Because the effect of withdrawals on creek flows are relatively rapid, continuous and episodic withdrawals must be considered separately.

CONTINUOUS GROUNDWATER ABSTRACTION

Continuous groundwater abstraction, such as that of CVRP in Scenarios 2 and 4 (except for the additional withdrawals due to recycled water unavailability) can be assessed on an annual basis using Table 1. Although there will be some seasonal variations, annual averages are representative. Coyote Creek and Fisher Creek

need to be considered separately, as they have different relationship to groundwater.

Coyote Creek

This creek mostly recharges groundwater (positive seepage).

For average conditions, CVRP abstraction under Scenario 2 results in a 23% increase of net stream seepage (2,371 AF/yr = 3.3 cfs). Breakdown between the two creeks is not provided, but as the municipal wells which would supply the CVRP demand are about half way between Coyote and Fisher Creeks, and even split of impacts can be assumed. Then, groundwater recharge from Coyote Creek would increase from 12,600 AF/yr (per Table 5-2) to 13,785. The corresponding creek flow reduction (1,185 AF/yr = 1.6 cfs) would have a minor impact on Coyote creek, and could easily be mitigated by a corresponding increase in release from Anderson Dam.

For drought conditions, the water table is mostly below the creek bottom and a lowering of the water table does not affect creek flow.

Fisher Creek

Mostly, Fisher Creek receives groundwater discharge (negative seepage), but Fisher Creek is dry during significant periods of time.

For average conditions, CVRP abstraction under Scenario 2 would decrease groundwater discharge to Fisher Creek from 4,100 AF/yr (per Table 5-2) to 2,914 AF/yr, a 29% reduction. During the wet season, this decreased groundwater discharge is negligible, however during the dry season, when creek flows is essentially equal to groundwater discharge a 29% reduction of discharge will significantly reduce flows and lengthen the time when the creek is dry. This impact is potentially significant.

For drought conditions, CVRP abstraction under Scenario 2 is predicted to increase net creek seepage (creek seepage minus groundwater discharge to creeks) from 10,512 to 11,193 AF/yr. As Coyote Creek seepage is essentially unchanged, because groundwater is below the creek bottom, the 681 AF/yr (0.94 cfs) reduction is entirely born by Fisher Creek. This reduction is smaller than for average conditions, but may still be significant because flows are generally less.

Under Scenario 4, the continuous groundwater abstraction by CVRP is 30% less. The impacts on stream flows cannot be easily gauged from the available model results, since those combine the continuous with the episodic withdrawals. However, a 30% reduction of impacts can be assumed as a first approximation.

EPISODIC ABSTRACTIONS

Episodic abstractions, such as those of MEC and CVRP during postulated unavailability of recycled water (30 days in wet season and 5 times 3 days in the rest of the year), cannot be assessed in terms of annual averages, because the impacts to the creeks occur relatively rapidly. Thus, the results provided in Table 1,

which are for an entire year, need to be complemented. For that purpose, the MODFLOW model developed by the Applicant was activated, and simulations were conducted for Scenarios 3 and 4. The 30-day withdrawals would occur during exceptionally wet periods and, therefore little impact to the creeks would be anticipated. Model simulations were therefore conducted for the 3-day withdrawals. For both Scenarios 3 and 4, two simulations were conducted with the 3-day withdrawals at the end of the dry season in 1990 (drought) and 1996 (average).

Scenario 3. MEC abstraction at the two new wells identified in the groundwater report was simulated for 3 days at a rate of 3,774 AF/yr (5.2 cfs).

Fisher Creek

Results are presented in Figure 1 in terms of groundwater flows to and from the creek

For average conditions (top plot) , Fisher Creek receives groundwater discharge over most of its length. MEC abstraction decreases groundwater discharge by a relatively small amount. The total flow reduction after 3 days is about 220 AF/yr (0.3 cfs). This indicates that, for a 3-day abstraction, the majority of the groundwater extracted is from storage, with limited impact to Fisher Creek.

For the drought condition, the model assumed that Fisher Creek was dry (stage = bottom elevation), which prevents groundwater recharge by the creek. However, the model also calculated groundwater discharge to Fisher Creek upstream of the MEC site, which is inconsistent with a dry creek. To resolve this discrepancy, water levels in the creek were set 0.5 ft above the creek bed. With this change the model indicates that the MEC abstraction would extract water from Fisher Creek, but the peak extraction, at the end of 3 days is also about 220 AF/yr (0.3 cfs). At that time, flow in Fisher Creek would be low and this additional withdrawal may dry up the creek. However, the creek would have been near the point of drying up anyway, so that the impact is not significant.

Coyote Creek

In general, Coyote creek recharges groundwater, except close to the Narrows.

For average conditions, the model indicates that groundwater levels are above the bottom of the creek so that a lowering of the water table results in an increase of creek recharge. At the end of 3 days, the recharge increase (equal to the decrease in creek flow) is also about 220 AF/yr (0.3 cfs). The creek flow is much higher and this decrease is not significant.

For drought conditions, the groundwater level is below the creek in the MEC area so that MEC pumping has essentially no effect on creek recharge.

Thus, for all conditions, 3-day abstraction by MEC under Scenario 3 has little impact on flows in Fisher and Coyote Creeks.

Scenario 4. The model results are shown in Figure 2. These results are similar to those of Scenario 3, as regards the 3-day pumping, but the starting point is different due to the constant CVRP abstraction. The latter were discussed above under continuous abstraction.

SUMMARY

A qualitative summary of the potential impacts on Narrows outflow and creek flows is provided in Table 2, based on the above discussion.

SOILS AND WATER RESOURCES APPENDIX C Table 2

Summary of Impacts

		MEC	CVRP
Narrows Outflow	LTD	Negligible impact	Potentially significant impact, can be mitigated with additional water import
	Ave	Negligible impact	Negligible impact
Creek Flow	LTD	Negligible impact	Negligible impact
	Ave	Negligible impact	Potentially significant impact to Fisher Creek

IMPACTS OF NOX DEPOSITION

BACKGROUND

The proposed Metcalf Energy Center will emit nitrogen oxides (NO_x) compounds that will eventually deposit on the ground. Calpine/Bechtel has used modeling using the Industrial Source Complex Short Term, Version 3 (ISCST3) model to predict nitrogen deposition resulting from MEC (CH2M-Hill, 2000). The analysis conservatively assumed that all nitrogen leaving the plant stacks would be of a depositional nature.

Nitrate has been mentioned as an issue with Coyote Valley groundwater. In 1980, nitrate exceeded the drinking water standard of 45 mg/l (10mg/l Nitrate-N) in twenty percent of the wells samples as part of a groundwater quality investigation (California State Department of Water Resources, 1980). A more recent report indicates that *“nitrate was the only water quality parameter which exceeded the drinking water standards of 45 mg/l in one half of wells representing the valley, and was somewhat elevated in the remaining wells”* (Behrens, 1998). Although the latter statement is based on only four wells, it indicates that nitrate is a relevant issue for Coyote Valley groundwater. Agricultural fertilizers are a contributor to nitrate levels in groundwater.

Another potential impact of nitrogen deposition relates to surface waters. Excess nutrients, including nitrogen, can cause growth of algae and macrophytes in surface waters, which can have detrimental effects on stream dissolved oxygen.

IMPACT ON GROUNDWATER

In the September 7, 2000 Informal Data Requests and Responses (Calpine/Bechtel 2000-b), the Applicant indicates that essentially no increase of groundwater concentrations will occur because nitrogen deposited on the ground will undergo i) uptake by plant and microbes, and ii) denitrification (transformation to nitrogen gas). These phenomena will indeed occur, but a more conservative interpretation would conclude that the already elevated nitrate levels in groundwater indicate nitrate saturation of the soils, so that any additional input of nitrogen will pass into the groundwater with little attenuation.

Calpine/Bechtel further states that fertilizer application should be based on soil nitrate tests, and thus atmospheric deposition from MEC will be compensated for by a decrease in fertilizer application. It is questionable if this will occur.

A conservative estimate of nitrogen deposition effects on groundwater can be made assuming that all deposition on agricultural lands will leach to the groundwater, while deposition on non-agricultural land will more likely be uptaken by plant growth and carried away by runoff. Based on deposition data presented by the Applicant, it is estimated that about one-twentieth of the emitted nitrogen will deposit on agricultural lands. This amounts to 4.9 tons-N/year, or 1.3 kg/ha/yr average on 14 square miles of valley floor. This nitrogen will raise the nitrogen concentration of groundwater discharging from the system, except for evaporation (which does not carry nitrogen). The corresponding flux is 18,983 AF/yr (Calpine/ Bechtel, 2000-a, Table 4-2) and the resulting increase in nitrogen concentration of the groundwater is 0.2 mg/l. This increase is relatively small, but not negligible for a nitrogen-stressed environment. Therefore, measures to decrease the overall nitrogen loading in the valley should be considered, for example through optimization of agricultural fertilizer application.

IMPACT ON CREEKS

Nitrogen contribution in Coyote and Fisher Creeks will occur due to direct deposition, groundwater discharge and runoff input.

DIRECT DEPOSITION

Because the surface area of the creeks is minimal compared to the total valley floor area, the increase in nitrogen concentration in the creek flow due to direct deposition will be negligible. For example, using an average creek width for Fisher Creek of 5 m and a length of 7 km with the deposition rate of 1.3 kg/ha/yr gives a loading of 4.5 kg/yr. With a dry season flow of 4,100 AF/yr (5.7 cfs), this leads to a nitrogen concentration increase of about 1×10^{-6} mg/l.

GROUNDWATER DISCHARGE

This component is applicable to Fisher Creek, and an increase of about 0.2 mg/l may be experienced, per the above groundwater assessment.

Runoff Input. This component would result from runoff carrying nitrogen deposited on the slopes adjoining Coyote Valley. Deposition in those areas would be roughly

equal to deposition in the valley, but the runoff flows would be larger than groundwater flows, so that the nitrogen concentration increase in runoff would be significantly less than 0.2 mg/l.

Thus, the total increase in nitrogen concentration would be less than 0.4 mg/l in Fisher Creek and less than 0.2 mg/l in Coyote Creek.

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Figure 1

Figure 2

APPENDIX D: BEST MANAGEMENT PRACTICES

Erosion Control and Stormwater Management Plans identify temporary and permanent erosion and stormwater control measures. When finalized, these plans serve as the stormwater pollution prevention plan as required under the General Construction Stormwater Permit issued by the State Water Resources Control Board.

Plans identify a number of potential best management practices for the construction and operation phases of the project that may be employed at the site and along linear facilities.

BEST MANAGEMENT PRACTICES THAT REDUCE EROSION AND SEDIMENT-LADEN STORMWATER RUNOFF

- Cover disturbed soils with mulch. This may be used in combination with temporary or permanent seeding strategies.
- Direct runoff away from disturbed areas by means of temporary drainage ways.
- Stabilize plant site roadways with compaction or gravel.
- Utilize soil stabilizers (most commonly water) on disturbed areas as appropriate and as required in Air Quality conditions.
- Utilize straw bale barriers to intercept sediment-laden runoff from small areas of disturbed soil.
- Create straw check dams to reduce erosion of existing drainage channels and to promote sedimentation behind the dam.
- Place silt fencing to promote sedimentation behind silt fence.
- Create stormwater retention basins to retain runoff and allow excessive sediment to settle out.
- Inspect temporary erosion control devices during construction in accordance with the Final Plan schedule.
- Insure replacement of damaged or missing structures.
- Notify project construction crew when to implement adequate precautions in anticipation of poor weather conditions.
- Dictate appropriate wetness when watering a road for dust suppression.
- Develop remedial erosion controls for problem areas, if any.
- Complying with applicable codes.
- Protect stockpiled soil with water-resistant tarps; protect stockpiles from runoff with hay bales or silt fencing, or suppress dust with water.

- Install temporary slope breakers (water bars or berms) at the portion of the pipeline that crosses grades steep enough to require such measures in order to divert water off the construction right-of-way and to reduce velocities.
- Slope breakers will be installed at spacing recommended by the Bureau of Land Management or Natural Resources Conservation Service.
- Slope breakers may be constructed from soil, silt fences, or stalked hay or straw bales.
- Straw bale barriers and/or check dams will be inspected and replaced or repaired as needed. Accumulated sediment will be removed when it reaches a depth of 6 inches.
- Sandbags placed along the toes of slopes and at linear facility structures will be inspected. Sediment will be removed after each significant storm event and deposited in a stable area not subject to erosion.
- If sediment accumulates over 1 foot behind the (sandbag) barrier, the contractor will remove or regrade the sediment.
- Mulched areas will be examined for damage or deterioration and reapplied as necessary.
- Protected storage areas for stockpiled soils or other materials will be inspected. Tarps or other coverings will be replaced and secured.
- Depending on the season, slope breakers will be inspected in areas of active equipment or within 24 hours of each 0.5-inch of rainfall.
- Slope breakers will be maintained until revegetation measures are successful or the area is stabilized.

BEST MANAGEMENT PRACTICES TO PREVENT STORMWATER CONTAMINATION

- Provide secondary containment for hazardous material delivery and storage areas to prevent spills or leakage of fluid materials from contaminating soil or soaking into the ground.
- Cover dumpsters and waste containers.
- Designate storage areas for construction wastes.
- Provide for proper storage of hazardous materials, paints, and related products.
- Train employees on the proper use of materials such as fuel, oil, asphalt and concrete compounds, acids, glues, solvents, etc.
- Implement a spill prevention and control plan.
- Timely remove construction wastes.
- Store all liquid wastes in covered containers.
- Use portable toilet facilities managed by licensed contractor.

GEOLOGY AND PALEONTOLOGY

Testimony of Robert Anderson

INTRODUCTION

The geology section discusses the project's potential impacts regarding geological hazards, geological and paleontological resources, and surface water hydrology. The purpose of the geology analysis is to verify that the applicable laws, ordinances, regulations, and standards (LORS) have been identified and that the project can be designed and constructed in accordance with all applicable LORS, and in a manner that protects environmental quality and assures public health and safety. Staff's objective is to ensure that there will be no significant adverse impacts to significant geological and paleontological resources, and surface water hydrology during project construction, operation and closure. The section concludes with staff's proposed monitoring and mitigation measures with respect to geological hazards, geological and paleontological resources, and surface water hydrology, with the inclusion of nine conditions of certification.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

The applicable LORS are listed in the AFC, in Sections 8.14, 8.15 and 8.16 (Calpine/Bechtel 1999a). A brief description of the LORS for geological hazards and resources, paleontological resources, and drainage and erosion control follows:

FEDERAL

There are no federal LORS for geological hazards and resources, or grading and erosion control. The United States Bureau of Land Management (BLM) requires an excavation permit for excavations and grading on land under their jurisdiction. The MEC is not located on lands under the jurisdiction of the BLM. Therefore, there are no federal LORS with respect to geological hazards or resources, or paleontological resources, that are applicable to this project.

STATE AND LOCAL

The California Building Code (CBC), 1998 edition, is based upon the Uniform Building Code (UBC), 1997 edition, which was published by the International Conference of Building Officials. The CBC is a series of standards that are used in investigation, design (Chapters 16 and 18) and construction (including grading and erosion control as found in Appendix Chapter 33) that includes supplemental standards specific to California. The CBC supplements their grading and construction ordinances and regulations.

The California Environmental Quality Act (CEQA) Guidelines Appendix G provides a checklist of questions that a lead agency should normally address if relevant to a project's environmental impacts.

Section (V) (c) asks if the project will directly or indirectly destroy a unique paleontological resource or site or unique geological feature.

Sections (VI) (a), (b), (c), (d), and (e) pose questions that are focused on whether or not the project would expose persons or structures to geological hazards.

Sections (X) (a) and (b) pose questions about the project's effect on mineral resources.

The Standard Procedures, Measures for Assessment and Mitigation of Adverse Impacts to Non-renewable Paleontologic Resources (SVP 1994)) are a set of procedures and standards for assessing and mitigating impacts to vertebrate paleontological resources. They were adopted in October 1994 by a national organization of vertebrate paleontologists (the Society of Vertebrate Paleontologists).

Santa Clara Valley Water District Ordinance No. 83-2 is a local ordinance that defines the limits of watercourses and the Santa Clara Valley Water District's jurisdiction over watercourse construction and management for the purposes of flood control. A Santa Clara Valley Water District permit is required for construction within 50 feet of the top of the bank of water courses throughout the county.

The City of San Jose Riparian Corridor Policy Study of May 17, 1994 (revised March 1999) includes guidelines for flood control, water quality and protection from construction. The guidelines for the riparian corridor are discussed in the **Soil and Water Resources** and the **Biology** sections of this document.

SETTING

The site is located in the northern portion of the Coyote Valley in Santa Clara County. The Diablo Range Mountains and the Santa Cruz Mountains bound the site to the east and west respectively. Site geology includes unconsolidated to semi-consolidated alluvium. Five soil units were encountered during the preliminary geotechnical investigation (Calpine/Becthel, AFC 1999a page 10G-5). The soil layers are differentiated by the relative percent of clay and gravels or sand and average standard penetration blow counts. Bedrock under the site is made of greenstone and serpentinized ultramafic rock. Exposures of greenstone and serpentinized ultramafic rock are seen on the nearby Tulare Hill. No fossils were observed during the site visit held on February 23, 1999. A minor spring was observed in one of the draws along the eastern side of Tulare Hill. The applicant indicates on page 10G-6 of the AFC that in April 1999, groundwater was encountered in a piezometer on site at an elevation of 237.2 feet above mean sea level (approximately 12.5 feet below the existing grade at the piezometer location). A more detailed discussion of the occurrence of groundwater at the site is presented in the **Water Resources** section of the staff assessment. Fisher Creek drains the western side of Coyote Valley into Coyote Creek.

ANALYSIS AND IMPACTS

FAULTING AND SEISMICITY

The region is extensively faulted and has a history of moderate to high seismicity (12 M_L (local magnitude) 6 or above earthquakes) (Calpine/Bechtel 1999a, AFC page 8.15-4). Commission staff visited the site on February 23, 1999, and did not observe any faults crossing the proposed power plant location. Commission staff have reviewed both the California Division of Mines and Geology (CDMG) Fault Activity Map of California and Adjacent Areas (CDMG 1994) and the Geologic Map of the San Francisco-san Jose Quadrangle (CDMG 1990) and found that no active faults are known to cross the proposed power plant footprint or the linear facilities. The project is located within seismic zone 4 as delineated on Figure 16-2 of the 1998 edition of the California Building Code. There are four faults within twenty miles of the site that are considered active and have the potential to generate a moment magnitude (M_W) 7 or larger earthquake. The active fault closest to the site is the Monte Vista-Shannon Fault. This fault is located approximately 1 mile west northwest of the site. The estimated peak horizontal ground acceleration associated with a M_W 7 earthquake on the fault is 0.5g.

A 10.2 mile long water supply line for the power plant has been proposed for the project. No active faults are known to cross the alignment of the proposed water supply line as depicted in the AFC supplement (Calpine/Bechtel 1999e, figures 2.1-1a and b MEC Site and Linear Facilities Location Map, dated September 29, 1999).

In April 1984, a Richter Magnitude 6.2 earthquake occurred near the town of Morgan Hill. The epicenter of the earthquake was located approximately 10 miles northeast of the site. The 1984 Morgan Hill earthquake was associated with a zone of seismicity associated with the Calaveras fault. During the earthquake, the Metcalf Substation, which is located approximately 7 miles southwest from the epicenter sustained minor damage. The damage was limited to a failed circuit breaker, a lighting arrestor, and to electric control panels that were not secured to the building. The estimated peak horizontal ground acceleration at the Metcalf Substation was 0.4g (Schiff, 1985). Two nearby dams were inspected by the Santa Clara Valley Water District ;high peak horizontal ground accelerations of 0.39 and 0.63g were recorded at the Leroy Anderson Dam. The left abutment of the Coyote Valley Dam accelerometer recorded a peak horizontal ground acceleration of 1.29g (USCOLD 1984). Both dams performed well during the earthquake despite the high ground accelerations.

In October 1989 the M_W 7.1 Loma Prieta earthquake occurred 14 miles southwest of the project site. The Metcalf Substation was damaged in the Loma Prieta earthquake. The damage was limited to a 230 kV lighting arrestor, a disconnect switch, and three live tank circuit breakers (Benuska 1990, page 328). Five of the transformers associated with the live tank circuit breakers in the 500kV switchyard developed oil leaks. The Leroy Anderson Dam was inspected after the Loma Prieta earthquake and found to have extensive but minor cracks along the dam's alignment. The maximum ground acceleration recorded at the dam was 0.43g

(USCOLD 1989). The maximum peak horizontal ground acceleration at the crest of Coyote Dam was 0.48g.

LIQUEFACTION, HYDROCOMPACTION, EXPANSIVE SOILS

Liquefaction is a condition in which a cohesionless soil may lose shear strength due to a sudden increase in pore water pressure. Liquefaction usually is observed in the upper 100 feet beneath a site if it occurs at all. The depth to groundwater at the proposed power plant location is 12 feet below the existing ground surface. Staff have reviewed the boring logs provided by the applicant and find that certain areas of the power plant foot print may be susceptible to liquefaction using the applicant's own criteria of high ground acceleration (0.5g), high ground water elevation (12 feet below existing grade), low standard penetration blow counts (0-16 blows per foot) and description of soil samples (soils vary from clayey loam to sands with gravel).

Hydrocompaction is the process of the loss of soil volume upon the application of water. The soils at the project site are partially saturated and dense and are not considered to be prone to hydrocompaction.

Soils that contain a high percentage of expansive clay minerals are prone to expansion, if subjected to an increase in water content. Expansive soils are usually measured with an index test such as the expansive index potential. In order for a soil to be a candidate for testing, the soil must have a high clay content. Near surface soils reported in the AFC (Calpine/Bechtel 1999a) are classified as silt, clay, silty sand and poorly graded sands. None of the clayey soils tested had a high plasticity index (Calpine/Bechtel 1999a, Table 10G6-1); therefore the potential for soil expansion is low.

CORROSION

The pH of soil samples taken by the applicant range from 8.1 to 8.5 (alkaline soils). The applicant has not yet conducted any field electrical resistivity surveys. Lowney Associates 2000 has reported that soil samples taken at the nearby proposed Coyote Valley Research Park may have a moderate to severe potential for corrosion. The applicant has indicated on page 10G-3 of the AFC that they intend to conduct field electrical resistivity surveys during the phase II field investigation. The phase II investigation is to be completed before final design of the proposed project.

GEOLOGICAL AND PALEONTOLOGICAL RESOURCES

No geological resources have been identified at the site or along the electric transmission line alignments, the natural gas supply line, or the water supply and wastewater return lines. Energy Commission staff have reviewed the Paleontological Resources Technical Report (Calpine/ Bechtel 1999b). No paleontological resources are known to exist at the site or along the linear facilities. The proposed water supply line northern termination is not included in the above mentioned report; however, the applicant has indicated that no paleontological resources are known to exist along the proposed alignment. Energy Commission staff have worked in Santa Clara County and had not encountered paleontological resources in the vicinity of the proposed water supply pipeline. Energy Commission

staff concur that paleontological resources have been encountered in alluvium in the Santa Clara Valley in the past, and that the paleontological sensitivity of the alluvium is high, but the probability of encountering paleontological resources along the proposed water supply pipeline is low. Energy Commission staff have proposed conditions of certification that will enable the applicant to mitigate impacts upon paleontological resources to a less than significant level should they be encountered during construction, operation, and closure of the project.

SURFACE WATER HYDROLOGY

The site is in Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map designation "D", but is located adjacent to a 100-year flood zone that follows the Fisher Creek drainage along the west and north sides of the site (FEMA, 1982). The 100-year flood elevation adjacent to the site is 247 feet. Elevations of the footprint for the building and the top of the storm water basin areas vary from 253 to 257 feet above mean sea level. The footprint for the site has been relocated to the east and south of the existing embankment. Minimum grade for the power plant area will be 1% and all drainage will be directed away from buildings within the footprint. There is a break in an embankment located between the power plant footprint and Fisher Creek. The breach is located near the portion of the proposed power plant where the switchyard would be located. It is staff's understanding that the embankment was once a part of the Laguna Seca Reclamation District, which is now defunct, and the embankment is not maintained. Power plant spill containment features are described by the applicant to have a minimum of one foot of freeboard. Run-off during a 100-year 24-hour storm event should not overwhelm the capacity of the proposed surface water drainage system and the proposed storm water management basin.

The Santa Clara Valley Water District has jurisdiction over projects that are located within fifty feet of or encroach into Fisher Creek. On October 22, 1999, the Santa Clara Valley Water District wrote a letter to the Energy Commission (SCVWD 1999a) expressing their concerns with respect to surface water drainage. The Santa Clara Valley Water District has asked the applicant for a detailed hydrology analysis. The results of the United States Army Corps of Engineers Hydrologic Engineering Center Water Surface Profile (HEC-II) modeling, prepared by the applicant's consultant for the proposed project, was accepted by the Santa Clara Valley Water District on July 6, 2000 (SCVWD July 6, 2000). Commission staff are in agreement with the Santa Clara Valley Water District regarding acceptance of the HEC-II modeling results as presented in the applicant's July 6, 2000, transmittal regarding said modeling of the surface water profiles for the drainage system for the proposed project.

The Leroy Anderson Dam is located approximately 8.3 miles south of the proposed power plant footprint. Sheet one of six of the inundation map for the Leroy Anderson Dam (Ensign and Buckley 1991) "Profile of Crests and Times for Northwest Valley Below Leroy Anderson Dam" provides maximum flood crest elevations at 8.0 and 8.5 miles north of the dam. The elevations are approximately 266.9 and 262.1 feet. The elevation of the proposed power plant pad is 257 feet. The difference in elevation between the proposed power plant fill pad and the

maximum elevation of the flood crest is an approximation of the range in feet of the depth of inundation by a catastrophic breach of the Leroy Anderson Dam. This range varies from approximately 5 to 10 feet of water over the finish grade of the fill pad. Commission staff have contacted the Santa Clara Valley Water District (the dam's owner) regarding the potential for a catastrophic breach of the dam. The Santa Clara Valley Water District indicated that the likelihood of an incident that may cause a flood inundation such as that shown of the Ensign and Buckley 1991 Leroy Anderson Dam Inundation Study maps is remote.

FACILITY CLOSURE

There are three kinds of facility closure. A definition and general approach to closure is presented in the General Conditions section of this document. Facility closure activities are not anticipated to impact geological or paleontological resources. This is due to the fact that no paleontological or geological resources are known to exist at the power plant location. In addition, decommissioning and closure of the power plant should not negatively affect geological or paleontological resources since the majority of the ground disturbed in plant decommissioning and closure would have been disturbed in the construction of the plant. Surface water hydrology impacts will depend upon the closure activities proposed.

POTENTIAL IMPACTS

SITE SPECIFIC IMPACTS

The project is not likely to have any impact on geological or paleontological resources. The HEC-II modeling results indicate that the construction and operation of the proposed power plant will have no significant impact on the local drainage system. The very low of potential site inundation due to a catastrophic failure of the Leroy Anderson Dam, is seen as a potentially significant impact onto the local power system with a low potential of occurrence.

CUMULATIVE IMPACTS

It is staff's opinion that the potential for a significant adverse cumulative impact on paleontological resources, geological resources, and geologic hazards is unlikely if the MEC is constructed according to the proposed conditions of certification. This is based on the fact that the site is not known to have significant paleontological or geological resources. Cumulative impacts on surface water hydrology are resolved since Commission staff have accepted the HEC-II modeling analysis for both the singular construction and operation of the proposed power plant and the construction and operation of the proposed power plant and the Coyote Valley Research Park. The HEC-II modeling results indicate that the construction and operation of the proposed power plant will have no significant impact on the local drainage system.

MITIGATION

Based upon the literature and archives search, field surveys and the preliminary geotechnical investigation for the project, the applicant has proposed monitoring and mitigation measures to be followed during the construction of the power plant, related natural gas supply line, electrical transmission line, and the water and waste water pipelines. Commission staff agree with the applicant that there is a low probability that vertebrate fossils will be encountered during construction of the power plant and related features.

The proposed conditions of certification are to allow the Energy Commission Compliance Project Manager (CPM) and the applicant to adopt a compliance monitoring scheme that will ensure LORS applicable to geological hazards, geological and paleontological resources, and surface water hydrology for the project are complied with.

RESPONSE TO PUBLIC AND AGENCY COMMENTS

Two verbal comments and one written comment have been forwarded to Commission staff with respect to geological hazards. No comments were received by Commission staff with respect to geological resources or paleontological resources. The two verbal comments concerned the depth to groundwater at the proposed power plant site and the potential for inundation of the power plant site by a catastrophic release from the Leroy Anderson Dam and Reservoir and the Coyote Dam and Reservoir. The written comment concerned the potential for liquefaction at the proposed power plant site and the potential for blockage of the Fisher Creek Channel by sediments washed down the draws along the eastern side of Tulare Hill.

The comment concerning the depth to groundwater is deferred to the **Water Resources Section** of the staff assessment. However, the depth to ground water at the site is known to vary, with respect to time and location. During the phase I geologic investigation for the proposed project a piezometer was installed at the site and the ground water elevation determined to be 237.2 feet above mean sea level. This elevation was equal to a depth to ground water of 12.5 feet below existing grade at the piezometer location in April 1999. The comment regarding the potential inundation of the proposed power plant location by a catastrophic release of water from the Leroy Anderson Dam is discussed in the surface water hydrology section above. Commission staff conclude that the potential for a catastrophic release from the Leroy Anderson Dam, inundating the site is remote. If such an inundation incident were to occur, other businesses and communities would also be inundated as well. The concern regarding blockage of Fisher Creek by a slope failure, soils and or rock at Tulare Hill is considered unlikely but mitigable should it occur. The colluvial and alluvial soils along the eastern side of Tulare Hill are not expected to be disturbed by construction or operation activities associated with the Metcalf Energy Center project. In addition, the soils in the draws along the eastern flank of Tulare Hill adjacent to the Fisher Creek and the proposed power plant footprint are shallow, of limited volume, and do not exhibit significant slope instability features. The soils in the draws have a minor apron at the bottom of the

draw that would allow for some accumulation of sediments without adversely affecting flood flow through Fisher Creek associated with a 100-year 24-hour storm event. Rock outcrops along the eastern side of Tulare Creek are limited in the vicinity of Fisher Creek but do not show any significant slope instability features. As long as the entity responsible for maintenance of Fisher Creek keeps the channel clear, then the potential for blockage of Fisher Creek during flood conditions such as the 100-year, 24-hour storm event are considered by Commission staff to be remote.

The concern regarding liquefaction has been addressed by both the applicant and Commission staff. A limited discussion on liquefaction is presented under the heading of liquefaction above. At the time of the preparation of this staff assessment, the final design of the foundation for the proposed Metcalf Energy Center had not been completed. Review and approval or disapproval of the foundation for the project is under the jurisdiction of the Chief Building Official.

CONCLUSION AND RECOMMENDATIONS

The applicant will likely be able to comply with applicable LORS for geological hazards, resources and paleontological resources. The project should have no adverse impact with respect to geological and paleontological resources. In order to further define the potential for liquefaction potential at the power plant site, a final geotechnical assessment of subsurface conditions should be conducted prior to designing the foundation of the power plant.

PROPOSED CONDITIONS OF CERTIFICATION

GEO-1 Prior to the start of construction, the project owner shall assign to the project an engineering geologist(s), certified by the State of California, to carry out the duties required by the 1998 edition of the California Building Code (CBC) Appendix Chapter 33, Section 3309.4. The certified engineering geologist(s) assigned must be approved by the CPM (the functions of the engineering geologist can be performed by the responsible geotechnical engineer, if that person has the appropriate California license).

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of construction, the project owner shall submit to the CPM for approval the name(s) and license number(s) of the certified engineering geologist(s) assigned to the project. The submittal should include a statement that CPM approval is needed. The CPM will approve or disapprove of the engineering geologist(s). If the engineering geologist(s) is subsequently replaced, the project owner shall submit for approval the name(s) and license number(s) of the newly assigned individual(s) to the CPM. The CPM will approve or disapprove of the engineering geologist(s).

GEO-2 The assigned engineering geologist(s) shall carry out the duties required by the 1998 CBC, Appendix Chapter 33, Section 3309.4 Engineered Grading Requirement, and Section 3318.1 – Final Reports. Those duties are:

- 1. Prepare the Engineering Geology Report. This report shall accompany the Plans and Specifications when applying to the CBO for the grading permit.***
2. Monitor geologic conditions during construction.
3. Prepare the Final Engineering Geology Report.

The Engineering Geology Report required by the 1998 CBC Appendix Chapter 33, Section 3309.3 Grading Designation, shall include an adequate description of the geology of the site, conclusions and recommendations regarding the effect of geologic conditions on the proposed development, and an opinion on the adequacy, for the intended use, of the site as affected by geologic factors.

The Final Engineering Geology Report to be completed after completion of grading, as required by the 1998 CBC Appendix Chapter 33, Section 3318.1, shall contain the following: A final description of the geology of the site and any new information disclosed during grading; and the effect of same on recommendations incorporated in the approved grading plan. The engineering geologist shall submit a statement that, to the best of his or her knowledge, the work within their area of responsibility is in accordance with the approved Engineering Geology Report and applicable provisions of this chapter.

Verification: (1) Within 15 days after submittal of the application(s) for grading permit(s) to the CBO, the project owner shall submit a signed statement to the CPM stating that the Engineering Geology Report has been submitted to the CBO as a supplement to the plans and specifications and that the recommendations contained in the report are incorporated into the plans and specifications. (2) Within 90 days following completion of the final grading, the project owner shall submit copies of the Final Engineering Geology Report required by the 1998 CBC Appendix Chapter 33, Section 3318 Completion of Work, to the CPM and the CBO.

PAL-1 Prior to the start of any project-related construction activities (defined as any construction-related vegetation clearance, ground disturbance and preparation, and site excavation activities), the project owner shall ensure that the designated paleontological resource specialist approved by the CPM is available for field activities and prepared to implement the conditions of certification.

The designated paleontological resources specialist shall be responsible for implementing all the paleontological conditions of certification and for using qualified personnel to assist in this work.

Protocol: The project owner shall provide the CPM with the name and statement of qualifications for the designated paleontological resource specialist.

The statement of qualifications for the designated paleontological resources specialist shall demonstrate that the specialist meets the following minimum qualifications: a degree in paleontology or geology or paleontological resource management; and at least three years of paleontological resource mitigation and field experience in California, including at least one year's experience leading paleontological resource mitigation and field activities.

The statement of qualifications shall include a list of specific projects the specialist has previously worked on; the role and responsibilities of the specialist for each project listed; and the names and phone numbers of contacts familiar with the specialist's work on these referenced projects.

If the CPM determines that the qualifications of the proposed paleontological resource specialist are not in concert with the above requirements, the project owner shall submit another individual's name and qualifications for consideration.

If the approved, designated paleontological resource specialist is replaced prior to completion of project mitigation, the project owner shall obtain CPM approval of the new designated paleontological resource specialist by submitting the name and qualifications of the proposed replacement to the CPM, at least ten (10) days prior to the termination or release of the preceding designated paleontological resource specialist.

Should emergency replacement of the designated specialist become necessary, the project owner shall immediately notify the CPM to discuss the qualifications of its proposed replacement specialist.

Verification: At least ninety (90) days prior to the start of construction, the project owner shall submit the name and resume and the availability for its designated paleontological resource specialist, to the CPM for review and approval. The CPM shall provide written approval or disapproval of the proposed paleontological resource specialist.

At least ten (10) days prior to the termination or release of a designated paleontological resource specialist, the project owner shall obtain CPM approval of the replacement specialist by submitting to the CPM the name and resume of the proposed new designated paleontological resource specialist. Should emergency replacement of the designated specialist become necessary, the project owner shall immediately notify the CPM to discuss the qualifications of its proposed replacement specialist.

PAL-2 Prior to the start of project construction, the designated paleontological resource specialist shall prepare a Paleontological Resources Monitoring and

Mitigation Plan to identify general and specific measures to minimize potential impacts to sensitive paleontological resources, and submit this plan to the CPM for review and approval. After CPM approval, the project owner's designated paleontological resource specialist shall be available to implement the Monitoring and Mitigation Plan, as needed, throughout project construction.

In addition to the project owner's adoption of the guidelines of the Society of Vertebrate Paleontologists (SVP 1994) the Paleontological Resources Monitoring and Mitigation Plan shall include, but not be limited to, the following elements and measures:

- A discussion of the sequence of project-related tasks, such as any pre-construction surveys, fieldwork, flagging or staking; construction monitoring; mapping and data recovery; fossil preparation and recovery; identification and inventory; preparation of final reports; and transmittal of materials for curation;
- Identification of the person(s) expected to assist with each of the tasks identified within this condition for certification, and a discussion of the mitigation team leadership and organizational structure, and the inter-relationship of tasks and responsibilities;
- Where monitoring of project construction activities is deemed necessary, the extent of the areas where monitoring is to occur and a schedule for the monitoring;
- An explanation that the designated paleontological resource specialist shall have the authority to halt or redirect construction in the immediate vicinity of a vertebrate fossil find until the significance of the find can be determined;
- A discussion of equipment and supplies necessary for recovery of fossil materials and any specialized equipment needed to prepare, remove, load, transport, and analyze large-sized fossils or extensive fossil deposits;
- Inventory, preparation, and delivery for curation into a retrievable storage collection in a public repository or museum, which meets the Society of Vertebrate Paleontologists standards and requirements for the curation of paleontological resources; and
- Identification of the institution that has agreed to receive any data and fossil materials recovered during project-related monitoring and mitigation work, discussion of any requirements or specifications for materials delivered for curation and how they will be met, and the name and phone number of the contact person at the institution.

Verification: At least sixty (60) days prior to the start of construction on the project, the project owner shall provide the CPM with a copy of the Monitoring and Mitigation Plan prepared by the designated paleontological resource specialist for review and approval. If the plan is not approved, the project owner, the designated

paleontological resource specialist, and the CPM shall meet to discuss comments and negotiate necessary changes.

PAL-3 Prior to the start of construction, and throughout the project construction period as needed for all new employees, the project owner and the designated paleontological resource specialist shall prepare and conduct CPM-approved training to all project managers, construction supervisors, and workers who operate ground disturbing equipment. The project owner and construction manager shall provide the workers with the CPM-approved set of procedures for reporting any sensitive paleontological resources or deposits that may be discovered during project-related ground disturbance.

Protocol: The paleontological training program shall discuss the potential to encounter paleontological resources in the field, the sensitivity and importance of these resources, and the legal obligations to preserve and protect such resources.

The training shall also include the set of reporting procedures that workers are to follow if paleontological resources are encountered during project activities. The training program shall be presented by the designated paleontological resource specialist and may be combined with other training programs prepared for cultural and biological resources, hazardous materials, or any other areas of interest or concern.

Verification: At least (30) thirty days prior to the start of project construction, the project owner shall submit to the CPM for review, comment, and written approval, the proposed employee training program and the set of reporting procedures the workers are to follow if paleontological resources are encountered during project construction.

If the employee training program and set of procedures are not approved, the project owner, the designated paleontological resource specialist, and the CPM shall meet to discuss comments and negotiate necessary changes, before the beginning of construction.

Documentation for training of additional new employees shall be provided in subsequent Monthly Compliance Reports, as appropriate.

PAL-4 The designated paleontological resource specialist shall be present at all times he or she deems appropriate to monitor construction-related grading, excavation, trenching, and/or augering in areas where potentially fossil-bearing sediments have been identified. If the designated paleontological resource specialist determines that full-time monitoring is not necessary in certain portions of the project area or along portions of the linear facility routes, the designated specialist shall notify the project owner.

Verification: The project owner shall include in the Monthly Compliance Reports a summary of paleontological activities conducted by the designated paleontological resource specialist.

PAL-5 The project owner, through the designated paleontological resource specialist, shall ensure recovery, preparation for analysis, analysis, identification and inventory, the preparation for curation, and the delivery for curation of all significant paleontological resource materials encountered and collected during the monitoring, data recovery, mapping, and mitigation activities related to the project.

Verification: The project owner shall maintain in its compliance files copies of signed contracts or agreements with the designated paleontological resource specialist and other qualified research specialists who will ensure the necessary data and fossil recovery, mapping, preparation for analysis, analysis, identification and inventory, and preparation for and delivery of all significant paleontological resource materials collected during data recovery and mitigation for the project. The project owner shall maintain these files for a period of three years after completion and approval of the CPM-approved Paleontological Resources Report and shall keep these files available for periodic audit by the CPM.

PAL-6 The project owner shall ensure preparation of a Paleontological Resources Report by the designated paleontological resource specialist. The Paleontological Resources Report shall be completed following completion of the analysis of the recovered fossil materials and related information. The project owner shall submit the paleontological report to the CPM for approval.

Protocol: The report shall include (but not be limited to) a description and inventory list of recovered fossil materials; a map showing the location of paleontological resources encountered; determinations of sensitivity and significance; and a statement by the paleontological resource specialist that project impacts to paleontological resources have been mitigated.

Verification: The project owner shall submit a copy of the Paleontological Resources Report to the CPM for review and approval under a cover letter stating that it is a confidential document. The report is to be prepared by the designated paleontological resource specialist within 90 days following completion of the analysis of the recovered fossil materials.

PAL-7 The project owner shall include in the facility closure plan a description regarding facility closure activity's potential to impact paleontological resources. The conditions for closure will be determined when a facility closure plan is submitted to the CPM twelve months prior to closure of the facility. If no activities are proposed that would potentially impact paleontological resources, then no mitigation measures for paleontological resource management are required in the facility closure plan.

Protocol: The closure requirements for paleontological resources are to be based upon the Paleontological Resources Report and the proposed grading activities for facility closure.

Verification: The project owner shall include a description of closure activities described above in the facility closure plan.

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FACILITY DESIGN

Testimony of Al McCuen, Steve Baker and Kisabuli

INTRODUCTION

Facility Design encompasses the civil, structural, mechanical and electrical engineering design of the project. The purpose of the Facility Design analysis is to:

- verify that the laws, ordinances, regulations and standards (LORS) applicable to the design and construction of the project have been identified;
- verify that the project and ancillary facilities have been described in sufficient detail, including proposed design criteria and analysis methods, to provide reasonable assurance that the project can be designed and constructed in accordance with all applicable LORS, and in a manner that protects environmental quality and assures public health and safety;
- determine whether special design features should be considered during final design to deal with conditions unique to the site which could influence public health and safety or environmental protection; and
- describe the design review and construction inspection process and establish Conditions of Certification that will be used to monitor and ensure compliance with the intent of the LORS and any special design requirements.

FINDINGS REQUIRED

The Warren Alquist Act requires the commission to “prepare a written decisionwhich includes...(a) Specific provisions relating to the manner in which the proposed facility is to be designed, sited, and operated in order to protect environmental quality and assure public health and safety [and] (d)(1) Findings regarding the conformity of the proposed site and related facilities...with public safety standards...and with other relevant local, regional, state and federal standards, ordinances, or laws...” (Pub. Resources Code, §25523).

SUBJECTS DISCUSSED

Subjects discussed in this analysis include:

- Identification of the LORS applicable to facility design;
- Evaluation of the applicant’s proposed design criteria, including the identification of those criteria that are essential to ensuring protection of the environment and public health and safety;
- Proposed modifications and additions to the Application for Certification (AFC) that are necessary to comply with applicable LORS; and
- Conditions of Certification proposed by staff to ensure that the project will be designed and constructed to protect environmental quality and assure public health and safety and comply with all applicable LORS.

SETTING

The site lies in seismic zone 4, the zone of greatest seismic shaking in the United States. Additional engineering design details are contained in the Application for Certification (AFC), in Appendices 10A through 10G (Calpine/Bechtel 1999a) and Project Description of this section.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

The applicable LORS for each engineering discipline (civil, structural, mechanical and electrical) are described in the AFC (Calpine/Bechtel 1999a, §§ 6.5, 7.3; Table 10.4-1; Appendices 10A through 10G).

ANALYSIS

The basis of this analysis is the applicant's proposed analysis and construction methods and list of LORS and design criteria set forth in the AFC.

SITE PREPARATION AND DEVELOPMENT

Staff has evaluated the proposed design criteria for grading, flood protection, erosion control, site drainage, and site access. Staff has assessed the criteria for designing and constructing linear support facilities such as a natural gas pipeline and electric transmission line. The applicant proposes to use accepted industry standards (see AFC Appendices 10A through 10G for a representative list of applicable industry standards), design practices, and construction methods in preparing and developing the site. Staff concludes that the project, including its linear facilities, will likely comply with all applicable site preparation LORS, and proposes Conditions of Certification (see below) to ensure compliance.

MAJOR STRUCTURES, SYSTEMS AND EQUIPMENT

Major structures, systems and equipment are defined as those structures and associated components or equipment that are necessary for power production and are costly to repair or replace, that require a long lead time to repair or replace, or that are used for the storage, containment, or handling of hazardous or toxic materials. Major structures and equipment will be identified through compliance with proposed Condition of Certification **GEN-2** (below).

The AFC contains lists of the civil, structural, mechanical and electrical design criteria that demonstrate the likelihood of compliance with applicable LORS, and that staff believes are essential to ensuring that the project is designed in a manner that protects the environment and public health and safety.

The project shall be designed and constructed to the 1998 edition of the California Building Code (CBC), and other applicable codes and standards in effect at the time design and construction of the project actually commence. In the event the initial designs are submitted to the Chief Building Official (CBO) for review and approval when the successor to the 1998 CBC is in effect, the 1998 CBC provisions, identified herein, shall be replaced with the applicable successor provisions.

Certain structures in a power plant may be required, under the CBC, to undergo dynamic lateral force (structural) analysis; others may be designed using the simpler static analysis procedure. In order to ensure that structures are analyzed using the appropriate lateral force procedure, staff has included Proposed Condition of Certification **STRUC-1** (below), which in part requires review and approval by the CBO of the project owner's proposed lateral force procedures prior to the start of construction.

PROJECT QUALITY PROCEDURES

The AFC (Calpine/Bechtel 1999a, § 2.4.5) describes a Project Quality Program that will be used on the project to maximize confidence that systems and components will be designed, fabricated, stored, transported, installed, and tested in accordance with the technical codes and standards appropriate for a powerplant. Compliance with design requirements will be verified through an appropriate program of inspections and audits. Employment of this Quality Assurance/Quality Control (QA/QC) program will ensure that the project is actually designed, procured, fabricated and installed as contemplated in this analysis.

COMPLIANCE MONITORING

Under Section 104.2 of the CBC, the building official is authorized and directed to enforce all the provisions of the CBC. For all energy facilities certified by the Energy Commission, the Energy Commission is the building official and has the responsibility to enforce the code. In addition, the Energy Commission has the power to render interpretations of the CBC and to adopt and enforce rules and supplemental regulations to clarify the application of the CBC's provisions.

The Energy Commission's design review and construction inspection process is developed to conform to CBC requirements and ensure that all facility design Conditions of Certification are met. As provided by Section 104.2.2 of the CBC, the Energy Commission appoints experts to carry out the design review and construction inspections and act as delegate CBO on behalf of the Energy Commission. These delegate agents typically include the local building official and independent consultants hired to cover technical expertise not provided by the local official. The applicant, through permit fees as provided by CBC Sections 107.2 and 107.3, pays the costs of the reviews and inspections. While building permits in addition to the Energy Commission certification are not required for this project, in lieu permit fees are paid by the applicant consistent with CBC Section 107, to cover the costs of reviews and inspections.

Engineering and compliance staff will invite the local building authority, either the City of San Jose or Santa Clara County, to act as CBO for the project. When an entity has been identified to perform the duties of CBO, Energy Commission staff will complete a Memorandum of Understanding (MOU) with that entity that outlines its roles and responsibilities and those of its subcontractors and delegate agents.

Staff has developed proposed Conditions of Certification to ensure protection of the environment and public health and safety and compliance with engineering design

LORS. Some of these conditions address the roles, responsibilities and qualifications of the applicant's engineers responsible for the design and construction of the project (proposed Conditions of Certification **GEN-1** through **GEN-8**). Engineers responsible for the design of the civil, structural, mechanical, and electrical portions of the project are required to be registered in California, and to sign and stamp each submittal of design plans, calculations, and specifications submitted to the CBO. These conditions require that no element of construction proceed without prior approval from the CBO. They also require that qualified special inspectors be assigned to perform or oversee special inspections required by the applicable LORS.

While the Energy Commission and delegate CBO have the authority to allow some flexibility in scheduling construction activities, these conditions are written to require that no element of construction of permanent facilities, which would be difficult to reverse or correct, may proceed without prior approval of plans by the CBO. For those elements of construction that are not difficult to reverse and are allowed to proceed without approval of the plans, the applicant shall bear the responsibility to fully modify those elements of construction to comply with all design changes that result from the CBO's plan review and approval process.

FACILITY CLOSURE

The removal of a facility from service, or decommissioning, as a result of the project reaching the end of its useful life, may range from "mothballing" to removal of all equipment and appurtenant facilities and restoration of the site. Future conditions that may affect the decommissioning decision are largely unknown at this time.

In order to assure that decommissioning of the facility will be completed in a manner that is environmentally sound, safe, and will protect public health and safety, the applicant shall submit a decommissioning plan to the Energy Commission for review and approval prior to the commencement of decommissioning. The plan shall include a discussion of the following items:

- proposed decommissioning activities for the project and all appurtenant facilities constructed as part of the project;
- all applicable LORS, local/regional plans, and the conformance of the proposed decommissioning activities to the applicable LORS and local/regional plans;
- the activities necessary to restore the site if the plan requires removal of all equipment and appurtenant facilities; and
- decommissioning alternatives, other than complete site restoration.

The above requirements should serve as adequate protection, even in the unlikely event of project abandonment. Staff has proposed general conditions (see **General Conditions**) to ensure that these measures are included in the Facility Closure Plan.

RESPONSE TO PUBLIC AND AGENCY COMMENTS

An Intervenor comment at the June 22, 2000 Preliminary Staff Assessment (PSA) workshop asked that Condition of Certification GEN-9 be retained with **Facility Design**. This item, involving facility closure, is adequately dealt with in the **General Condition** portion of this document. Therefore, staff believes it is unnecessary to retain Condition of Certification GEN-9, that originally appeared in the PSA in this section, as it is covered in General Conditions.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

1. The laws, ordinances, regulations, and standards (LORS) identified in the AFC and supporting documents are those applicable to the project.
2. Staff has evaluated the proposed engineering LORS, design criteria and design methods in the record, and concludes that the design, construction and eventual closure of the project are likely to comply with applicable LORS.
3. The Conditions of Certification proposed will ensure that the proposed facilities are designed and constructed in accordance with applicable LORS. This will occur through the use of design review, plan checking and field inspections, which are to be performed by the CBO or other Energy Commission delegate agent. Staff will audit the CBO to ensure satisfactory performance.
4. The Energy Commission design review and construction inspection process will be in place for the project and will allow construction to start as scheduled if the project is certified. The process will provide the necessary reviews to ensure compliance with applicable facility design LORS and Conditions of Certification.
5. Whereas future conditions that may affect decommissioning are largely unknown at this time, it can reasonably be concluded that if the project owner submits a decommissioning plan as required in the **General Conditions** portion of this document prior to the commencement of decommissioning, the decommissioning procedure is likely to occur in compliance with all applicable LORS.

RECOMMENDATIONS

Energy Commission staff recommends that:

1. The Conditions of Certification proposed herein be adopted to ensure that the project is designed and constructed to protect environmental quality, and assure public health and safety, and to ensure compliance with all applicable engineering LORS;
2. The project be designed and built to the 1998 CBC (or successor standard, if such is in effect when the initial project engineering designs are submitted for review); and

3. The CBO shall review the final designs, conduct plan checking and perform field inspections during construction, and Energy Commission staff shall audit and monitor the CBO to ensure satisfactory performance.

CONDITIONS OF CERTIFICATION

GEN-1 The project owner shall design, construct and inspect the project in accordance with the 1998 California Building Code (CBC) and all other applicable LORS in effect at the time initial design plans are submitted to the CBO for review and approval. The CBC in effect is that edition that has been adopted by the California Building Standards Commission and published at least 180 days previously. All transmission facilities (lines, switchyards, switching stations, and substations) are handled in Conditions of Certification TSE-1, TSE-2 and TSE-3 in the **Transmission System Engineering** Section of this document.

Protocol: In the event that the initial engineering designs are submitted to the CBO when a successor to the 1998 CBC is in effect, the 1998 CBC provisions identified herein shall be replaced with the applicable successor provisions. Where, in any specific case, different sections of the code specify different materials, methods of construction, or other requirements, the most restrictive shall govern. Where there is a conflict between a general requirement and a specific requirement, the specific requirement shall govern.

Verification: Within 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) after receipt of the Certificate of Occupancy, the project owner shall submit to the California Energy Commission Compliance Project Manager (CPM) a statement of verification, signed by the responsible design engineer, attesting that all designs, construction, installation and inspection requirements of the applicable LORS and the Energy Commission's Decision have been met in the area of facility design. The project owner shall provide the CPM a copy of the Certificate of Occupancy within 30 days of receipt from the CBO [1998 CBC, Section 109 – Certificate of Occupancy.]

GEN-2 The project owner shall furnish to the CPM and to the CBO a schedule of facility design submittals, a Master Drawing List, and a Master Specifications List. The schedule shall contain a list of proposed submittal packages of designs, calculations, and specifications for major structures and equipment. To facilitate audits by Energy Commission staff, the project owner shall provide specific packages to the CPM when requested.

Verification: At least 60 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of rough grading, the project owner shall submit the schedule, a Master Drawing List, and a Master Specifications List to the CBO and to the CPM. The project owner shall provide schedule updates in the Monthly Compliance Report.

GEN-3 The project owner shall make payments to the CBO for design review, plan check and construction inspection, equivalent to the fees listed in the 1998 CBC, Chapter 1, Section 107 and Table 1-A, Building Permit Fees; Appendix Chapter 33, Section 3310 and Table A-33-A, Grading Plan Review Fees; and Table A-33-B, Grading Permit Fees. If Santa Clara County has adjusted the CBC fees for design review, plan check and construction inspection, the project owner shall pay the adjusted fees.

Verification: The project owner shall make the required payments to the CBO at the time of submittal of the plans, design calculations, specifications, or soil reports. The project owner shall send a copy of the CBO's receipt of payment to the CPM in the next Monthly Compliance Report indicating that the applicable fees have been paid.

GEN-4 Prior to the start of rough grading, the project owner shall assign a California registered architect, structural engineer or civil engineer, as a resident engineer (RE), to be in general responsible charge of the project [Building Standards Administrative Code (Cal. Code Regs., tit. 24, § 4-209, Designation of Responsibilities).] All transmission facilities (lines, switchyards, switching stations, and substations) are handled in Conditions of Certification TSE-1, TSE-2 and TSE-3 in the **Transmission System Engineering** Section of this document.

The RE may delegate responsibility for portions of the project to other registered engineers. Registered mechanical and electrical engineers may be delegated responsibility for mechanical and electrical portions of the project respectively. A project may be divided into parts, provided each part is clearly defined as a distinct unit. Separate assignment of general responsible charge may be made for each designated part.

Protocol: The RE shall:

1. Monitor construction progress to ensure compliance with LORS;
2. Ensure that construction of all the facilities conforms in every material respect to the applicable LORS, these Conditions of Certification, approved plans, and specifications;
3. Prepare documents to initiate changes in the approved drawings and specifications when directed by the project owner or as required by conditions on the project;
4. Be responsible for providing the project inspectors and testing agency(ies) with complete and up-to-date set(s) of stamped drawings, plans, specifications and any other required documents;

5. Be responsible for the timely submittal of construction progress reports to the CBO from the project inspectors, the contractor, and other engineers who have been delegated responsibility for portions of the project; and
6. Be responsible for notifying the CBO of corrective action or the disposition of items noted on laboratory reports or other tests as not conforming to the approved plans and specifications.

The RE shall have the authority to halt construction and to require changes or remedial work, if the work does not conform to applicable requirements.

If the RE or the delegated engineers are reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, the name, qualifications and registration number of the RE and any other delegated engineers assigned to the project. The project owner shall notify the CPM of the CBO's approvals of the RE and other delegated engineer(s) within five days of the approval.

If the RE or the delegated engineer(s) are subsequently reassigned or replaced, the project owner has five days in which to submit the name, qualifications, and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within five days of the approval.

GEN-5 Prior to the start of rough grading, the project owner shall assign at least one of each of the following California registered engineers to the project: A) a civil engineer; B) a geotechnical engineer or a civil engineer experienced and knowledgeable in the practice of soils engineering; C) a design engineer, who is either a structural engineer or a civil engineer fully competent and proficient in the design of powerplant structures and equipment supports; D) a mechanical engineer; and E) an electrical engineer. [California Business and Professions Code section 6704 et seq., and sections 6730 and 6736 requires state registration to practice as a civil engineer or structural engineer in California.] All transmission facilities (lines, switchyards, switching stations, and substations) are handled in Conditions of Certification TSE-1, TSE-2 and TSE-3 in the **Transmission System Engineering** Section of this document.

The tasks performed by the civil, mechanical, electrical or design engineers may be divided between two or more engineers, as long as each engineer is responsible for a particular segment of the project (e.g., proposed earthwork, civil structures, powerplant structures, equipment support). No segment of the project shall have more than one responsible engineer. The transmission line may be the responsibility of a separate California registered electrical engineer.

Protocol: The project owner shall submit to the CBO for review and approval, the names, qualifications and registration numbers of all engineers assigned to the project. [1998 CBC, Section 104.2, Powers and Duties of Building Official.]

If any one of the designated engineers is subsequently reassigned or replaced, the project owner shall submit the name, qualifications and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer.

Protocol: A: The civil engineer shall:

1. Design, or be responsible for design, stamp, and sign all plans, calculations, and specifications for proposed site work, civil works, and related facilities. At a minimum, these include: grading, site preparation, excavation, compaction, construction of secondary containment, foundations, erosion and sedimentation control structures, drainage facilities, underground utilities, culverts, site access roads, and sanitary sewer systems; and
2. Provide consultation to the RE during the construction phase of the project, and recommend changes in the design of the civil works facilities and changes in the construction procedures.

Protocol: B: The geotechnical engineer or civil engineer, experienced and knowledgeable in the practice of soils engineering, shall:

1. Review all the engineering geology reports, and prepare final soils grading report;
2. Prepare the soils engineering reports required by the 1998 CBC, Appendix Chapter 33, Section 3309.5 – Soils Engineering Report, and Section 3309.6 – Engineering Geology Report;
3. Be present, as required, during site grading and earthwork to provide consultation and monitor compliance with the requirements set forth in the 1998 CBC, Appendix Chapter 33, section 3317, Grading Inspections;
4. Recommend field changes to the civil engineer and RE;
5. Review the geotechnical report, field exploration report, laboratory tests, and engineering analyses detailing the nature and extent of the site soils that may be susceptible to liquefaction, rapid settlement or collapse when saturated under load; and
6. Prepare reports on foundation investigation to comply with the 1998 CBC, Chapter 18 section 1804, Foundation Investigations.

This engineer shall be authorized to halt earthwork and to require changes; if site conditions are unsafe or do not conform with predicted conditions used as a basis for design of earthwork or foundations. [1998 CBC, section 104.2.4, Stop orders.]

Protocol: C: The design engineer shall:

1. Be directly responsible for the design of the proposed structures and equipment supports;
2. Provide consultation to the RE during design and construction of the project;
3. Monitor construction progress to ensure compliance with LORS;
4. Evaluate and recommend necessary changes in design; and
5. Prepare and sign all major building plans, specifications and calculations.

Protocol: D: The mechanical engineer shall be responsible for, and sign and stamp a statement with, each mechanical submittal to the CBO, stating that the proposed final design plans, specifications, and calculations conform with all of the mechanical engineering design requirements set forth in the Energy Commission's Decision.

Protocol: E: The electrical engineer shall:

7. Be responsible for the electrical design of the project; and
8. Sign and stamp electrical design drawings, plans, specifications, and calculations.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of rough grading, the project owner shall submit to the CBO for review and approval, the names, qualifications and registration numbers of all the responsible engineers assigned to the project. The project owner shall notify the CPM of the CBO's approvals of the engineers within five days of the approval.

If the designated responsible engineer is subsequently reassigned or replaced, the project owner has five days in which to submit the name, qualifications, and registration number of the newly assigned engineer to the CBO for review and approval. The project owner shall notify the CPM of the CBO's approval of the new engineer within five days of the approval.

GEN-6 Prior to the start of an activity requiring special inspection, the project owner shall assign to the project, qualified and certified special inspector(s) who shall be responsible for the special inspections required by the 1998 CBC, Chapter 17, Section 1701, Special Inspections, Section, 1701.5 Type

of Work (requiring special inspection), and Section 106.3.5, Inspection and observation program. All transmission facilities (lines, switchyards, switching stations, and substations) are handled in Conditions of Certification TSE-1, TSE-2 and TSE-3 in the **Transmission System Engineering** Section of this document.

Protocol: The special inspector shall:

1. Be a qualified person who shall demonstrate competence, to the satisfaction of the CBO, for inspection of the particular type of construction requiring special or continuous inspection;
2. Observe the work assigned for conformance with the approved design drawings and specifications;
3. Furnish inspection reports to the CBO and RE. All discrepancies shall be brought to the immediate attention of the RE for correction, then, if uncorrected, to the CBO and the CPM for corrective action; and
4. Submit a final signed report to the RE, CBO, and CPM, stating whether the work requiring special inspection was, to the best of the inspector's knowledge, in conformance with the approved plans and specifications and the applicable provisions of the applicable edition of the CBC.

A certified weld inspector, certified by the American Welding Society (AWS), and/or American Society of Mechanical Engineers (ASME) as applicable, shall inspect welding performed on-site requiring special inspection (including structural, piping, tanks and pressure vessels).

Verification: At least 15 days prior to the start of an activity requiring special inspection, the project owner shall submit to the CBO for review and approval, with a copy to the CPM, the name(s) and qualifications of the certified weld inspector(s), or other certified special inspector(s) assigned to the project to perform one or more of the duties set forth above. The project owner shall also submit to the CPM a copy of the CBO's approval of the qualifications of all special inspectors in the next Monthly Compliance Report.

If the special inspector is subsequently reassigned or replaced, the project owner has five days in which to submit the name and qualifications of the newly assigned special inspector to the CBO for approval. The project owner shall notify the CPM of the CBO's approval of the newly assigned inspector within five days of the approval.

GEN-7 The project owner shall keep the CBO informed regarding the status of engineering and construction. If any discrepancy in design and/or construction is discovered, the project owner shall document the discrepancy and recommend the corrective action required. The discrepancy documentation shall be submitted to the CBO for review and approval. The discrepancy documentation shall reference this Condition of Certification and, if appropriate, the applicable sections of the CBC and/or other LORS.

Verification: The project owner shall submit monthly construction progress reports to the CBO and CPM. The project owner shall transmit a copy of the CBO's approval or disapproval of any corrective action taken to resolve a discrepancy to the CPM within 15 days. If disapproved, the project owner shall advise the CPM, within five days, the reason for disapproval, and the revised corrective action to obtain CBO's approval.

GEN-8 The project owner shall obtain the CBO's final approval of all completed work. The project owner shall request the CBO to inspect the completed structure and review the submitted documents. When the work and the "as-built" and "as graded" plans conform to the approved final plans, the project owner shall notify the CPM regarding the CBO's final approval. The marked up "as-built" drawings for the construction of structural and architectural work shall be submitted to the CBO. Changes approved by the CBO shall be identified on the "as-built" drawings [1998 CBC, Section 108, Inspections.]

Verification: Within 15 days of the completion of any work, the project owner shall submit to the CBO, with a copy to the CPM, (a) a written notice that the completed work is ready for final inspection, and (b) a signed statement that the work conforms to the final approved plans.

CIVIL-1 Prior to the start of site grading, the project owner shall submit to the CBO for review and approval the following:

1. Design of the proposed drainage structures and the grading plan;
2. An erosion and sedimentation control plan;
3. Related calculations and specifications, signed and stamped by the responsible civil engineer; and
4. Soils report as required by the 1998 CBC, Appendix Chapter 33, Section 3309.5, Soils Engineering Report and Section 3309.6, Engineering Geology Report.

Verification: At least 15 days prior to the start of site grading, the project owner shall submit the documents described above to the CBO for review and approval. In the next Monthly Compliance Report following the CBO's approval, the project owner shall submit a written statement certifying that the documents have been approved by the CBO.

CIVIL-2 The resident engineer shall, if appropriate, stop all earthwork and construction in the affected areas when the responsible geotechnical engineer or civil engineer experienced and knowledgeable in the practice of soils engineering identifies unforeseen adverse soil or geologic conditions. The project owner shall submit modified plans, specifications and calculations to the CBO based on these new conditions. The project owner shall obtain approval from the CBO before resuming earthwork and construction in the affected area. [1998 CBC, Section 104.2.4, Stop orders.]

Verification: The project owner shall notify the CPM, within five days, when earthwork and construction is stopped as a result of unforeseen adverse geologic/soil conditions. Within five days of the CBO's approval, the project owner shall provide to the CPM a copy of the CBO's approval to resume earthwork and construction in the affected areas.

CIVIL-3 The project owner shall perform inspections in accordance with the 1998 CBC, Chapter 1, Section 108, Inspections; Chapter 17, Section 1701.6, Continuous and Periodic Special Inspection; and Appendix Chapter 33, Section 3317, Grading Inspection. All plant site-grading operations shall be subject to inspection by the CBO and the CPM.

Protocol: If, in the course of inspection, it is discovered that the work is not being done in accordance with the approved plans, the discrepancies shall be reported immediately to the resident engineer, the CBO, and the CPM. The project owner shall prepare a written report detailing all discrepancies and non-compliance items, and the proposed corrective action, and send copies to the CBO and the CPM.

Verification: Within five days of the discovery of any discrepancies, the resident engineer shall transmit to the CBO and the CPM a Non-Conformance Report (NCR), and the proposed corrective action. Within five days of resolution of the NCR, the project owner shall submit the details of the corrective action to the CBO and the CPM. A list of NCRs, for the reporting month, shall also be included in the following Monthly Compliance Report.

CIVIL-4 After completion of finished grading and erosion and sedimentation control and drainage facilities, the project owner shall obtain the CBO's approval of the final "as-graded" grading plans, and final "as-built" plans for the erosion and sedimentation control facilities [1998 CBC, Section 109, Certificate of Occupancy.]

Verification: Within 30 days of the completion of the erosion and sediment control mitigation and drainage facilities, the project owner shall submit to the CBO the responsible civil engineer's signed statement that the installation of the facilities and all erosion control measures were completed in accordance with the final approved combined grading plans, and that the facilities are adequate for their intended purposes. The project owner shall submit a copy of this report to the CPM in the next Monthly Compliance Report.

STRUC-1 Prior to the start of any increment of construction, the project owner shall submit to the CBO for review and approval the proposed lateral force procedures for project structures and the applicable designs, plans and drawings for project structures. Proposed lateral force procedures, designs, plans and drawings shall be those for:

1. Major project structures;
2. Major foundations, equipment supports and anchorage;

3. Large field fabricated tanks;
4. Turbine/generator pedestal; and
5. Switchyard structures.

In addition, the project owner shall, prior to the start of any increment of construction, get approval from the CBO of the lateral force procedures proposed for project structures to comply with the lateral force provisions of the CBC.

Protocol: The project owner shall:

1. Obtain approval from the CBO of lateral force procedures proposed for project structures;
2. Obtain approval from the CBO for the final design plans, specifications, calculations, soils reports, and applicable quality control procedures. If there are conflicting requirements, the more stringent shall govern (i.e., highest loads, or lowest allowable stresses shall govern). All plans, calculations, and specifications for foundations that support structures shall be filed concurrently with the structure plans, calculations, and specifications [1998 CBC, Section 108.4, Approval Required];
3. Submit to the CBO the required number of copies of the structural plans, specifications, calculations, and other required documents of the designated major structures at least 90 days (or a lesser number of days mutually agreed to by the project owner and the CBO), prior to the start of on-site fabrication and installation of each structure, equipment support, or foundation [1998 CBC, Section 106.4.2, Retention of plans and Section 106.3.2, Submittal documents.]; and
4. Ensure that the final plans, calculations, and specifications clearly reflect the inclusion of approved criteria, assumptions, and methods used to develop the design. The final designs, plans, calculations and specifications shall be signed and stamped by the responsible design engineer [1998 CBC, Section 106.3.4, Architect or Engineer of Record.]

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of any increment of construction, the project owner shall submit to the CBO, with a copy to the CPM, the responsible design engineer's signed statement that the final design plans, specifications and calculations conform with all of the requirements set forth in the Energy Commission's Decision.

If the CBO discovers non-conformance with the stated requirements, the project owner shall resubmit the corrected plans to the CBO within 20 days of receipt of the nonconforming submittal with a copy of the transmittal letter to the CPM.

The project owner shall submit to the CPM a copy of a statement from the CBO that the proposed structural plans, specifications, and calculations have been approved and are in conformance with the requirements set forth in the applicable LORS.

STRUC-2 The project owner shall submit to the CBO the required number of sets of the following:

1. Concrete cylinder strength test reports (including date of testing, date sample taken, design concrete strength, tested cylinder strength, age of test, type and size of sample, location and quantity of concrete placement from which sample was taken, and mix design designation and parameters);
2. Concrete pour sign-off sheets;
3. Bolt torque inspection reports (including location of test, date, bolt size, and recorded torques);
4. Field weld inspection reports (including type of weld, location of weld, inspection of non-destructive testing (NDT) procedure and results, welder qualifications, certifications, qualified procedure description or number (ref: AWS); and
5. Reports covering other structure activities requiring special inspections shall be in accordance with the 1998 CBC, Chapter 17, Section 1701, Special Inspections, Section 1701.5, Type of Work (requiring special inspection), Section 1702, Structural Observation and Section 1703, Nondestructive Testing.

Verification: If a discrepancy is discovered in any of the above data, the project owner shall, within five days, prepare and submit an NCR describing the nature of the discrepancies to the CBO, with a copy of the transmittal letter to the CPM. The NCR shall reference the Condition(s) of Certification and the applicable CBC chapter and section. Within five days of resolution of the NCR, the project owner shall submit a copy of the corrective action to the CBO and the CPM.

The project owner shall transmit a copy of the CBO's approval or disapproval of the corrective action to the CPM within 15 days. If disapproved, the project owner shall advise the CPM, within five days, the reason for disapproval, and the revised corrective action to obtain CBO's approval.

STRUC-3 The project owner shall submit to the CBO design changes to the final plans required by the 1998 CBC, Chapter 1, Section 106.3.2, Submittal documents, and Section 106.3.3, Information on plans and specifications, including the revised drawings, specifications, calculations, and a complete description of, and supporting rationale for, the proposed changes, and shall give the CBO prior notice of the intended filing.

Verification: On a schedule suitable to the CBO, the project owner shall notify the CBO of the intended filing of design changes, and shall submit the required number of sets of revised drawings and the required number of copies of the other above-mentioned documents to the CBO, with a copy of the transmittal letter to the

CPM. The project owner shall notify the CPM, via the Monthly Compliance Report, when the CBO has approved the revised plans.

STRUC-4 Tanks and vessels containing quantities of toxic or hazardous materials exceeding amounts specified in Chapter 3, Table 3-E of the 1998 CBC shall, at a minimum, be designed to comply with Occupancy Category 2 of the 1998 CBC.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of installation of the tanks or vessels containing the above specified quantities of highly toxic or explosive substances that would be hazardous to the safety of the general public if released, the project owner shall submit to the CBO for review and approval, final design plans, specifications, and calculations, including a copy of the signed and stamped engineer's certification.

The project owner shall send copies of the CBO approvals of plan checks to the CPM in the following Monthly Compliance Report. The project owner shall also transmit a copy of the CBO's inspection approvals to the CPM in the Monthly Compliance Report following completion of any inspection.

MECH-1 Prior to the start of any increment of piping construction, the project owner shall submit, for CBO review and approval, the proposed final design drawings, specifications and calculations for each plant piping system (exclude domestic water, refrigeration systems, and small bore piping, i.e., piping and tubing with a diameter less than two and one-half inches). The submittal shall also include the applicable QA/QC procedures. The project owner shall design and install all piping, other than domestic water, refrigeration, and small bore piping to the applicable edition of the CBC. Upon completion of construction of any piping system, the project owner shall request the CBO's inspection approval of said construction [1998 CBC, Section 106.3.2, Submittal documents, Section 108.3, Inspection Requests.]

Protocol: The responsible mechanical engineer shall submit a signed and stamped statement to the CBO when:

1. The proposed final design plans, specifications and calculations conform with all of the piping requirements set forth in the Energy Commission's Decision; and
2. All of the other piping systems, except domestic water, refrigeration systems and small bore piping have been designed, fabricated and installed in accordance with all applicable ordinances, regulations, laws and industry standards, including, as applicable:
 - American National Standards Institute (ANSI) B31.1 (Power Piping Code);
 - ANSI B31.2 (Fuel Gas Piping Code);
 - ANSI B31.3 (Chemical Plant and Petroleum Refinery Piping Code);

- ANSI B31.8 (Gas Transmission and Distribution Piping Code); and
- Specific City/County code.

The CBO may require the project owner to employ special inspectors to report directly to the CBO to monitor shop fabrication or equipment installation [1998 CBC, Section 104.2.2, Deputies.]

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of any increment of piping construction, the project owner shall submit to the CBO for approval, with a copy of the transmittal letter to the CPM, the above listed documents for that increment of construction of piping systems, including a copy of the signed and stamped engineer's certification of conformance with the Energy Commission's Decision. The project owner shall transmit a copy of the CBO's inspection approvals to the CPM in the Monthly Compliance Report following completion of any inspection.

MECH-2 For all pressure vessels installed in the plant, the project owner shall submit to the CBO and California Occupational Safety and Health Administration (Cal-OSHA), prior to operation, the code certification papers and other documents required by the applicable LORS. Upon completion of the installation of any pressure vessel, the project owner shall request the appropriate CBO and/or Cal-OSHA inspection of said installation [1998 CBC, Section 108.3 – Inspection Requests.]

The project owner shall:

1. Ensure that all boilers and fired and unfired pressure vessels are designed, fabricated and installed in accordance with the appropriate section of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code, or other applicable code. Vendor certification, with identification of applicable code, shall be submitted for prefabricated vessels and tanks; and
2. Have the responsible design engineer submit a statement to the CBO that the proposed final design plans, specifications and calculations conform to all of the requirements set forth in the appropriate ASME Boiler and Pressure Vessel Code or other applicable codes.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of on-site fabrication or installation of any pressure vessel, the project owner shall submit to the CBO for review and approval, final design plans, specifications and calculations, including a copy of the signed and stamped engineer's certification, with a copy of the transmittal letter to the CPM.

The project owner shall send copies of the CBO plan check approvals to the CPM in the following Monthly Compliance Report. The project owner shall also transmit a copy of the CBO's and/or Cal-OSHA inspection approvals to the CPM in the Monthly Compliance Report following completion of any inspection.

MECH-3 Prior to the start of construction of any heating, ventilating, air conditioning (HVAC) or refrigeration system, the project owner shall submit to the CBO for review and approval the design plans, specifications, calculations and quality control procedures for that system. Packaged HVAC systems, where used, shall be identified with the appropriate manufacturer's data sheets.

Protocol: The project owner shall design and install all HVAC and refrigeration systems within buildings and related structures in accordance with the applicable edition of the CBC. Upon completion of any increment of construction, the project owner shall request the CBO's inspection and approval of said construction. The final plans, specifications and calculations shall include approved criteria, assumptions and methods used to develop the design. In addition, the responsible mechanical engineer shall sign and stamp all plans, drawings and calculations and submit a signed statement to the CBO that the proposed final design plans, specifications and calculations conform with the applicable LORS [1998 CBC, Section 108.7, Other Inspections; Section 106.3.4, Architect or Engineer of Record.]

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of construction of any HVAC or refrigeration system, the project owner shall submit to the CBO the required HVAC and refrigeration calculations, plans and specifications, including a copy of the signed and stamped statement from the responsible mechanical engineer certifying compliance with the applicable edition of the CBC, with a copy of the transmittal letter to the CPM.

The project owner shall send copies of CBO comments and approvals to the CPM in the next Monthly Compliance Report. The project owner shall transmit a copy of the CBO's inspection approvals to the CPM in the Monthly Compliance Report following completion of any inspection.

MECH-4 Prior to the start of each increment of plumbing construction, the project owner shall submit for CBO's approval the final design plans, specifications, calculations, and QA/QC procedures for all plumbing systems, potable water systems, drainage systems (including sanitary drain and waste), toilet rooms, building energy conservation systems, and temperature control and ventilation systems, including water and sewer connection permits issued by the local agency. Upon completion of any increment of construction, the project owner shall request the CBO's inspection approval of said construction [1998 CBC, Section 108.3, Inspection Requests, Section 108.4, Approval Required.]

Protocol: The project owner shall design, fabricate and install:

1. Plumbing, potable water, all drainage systems, and toilet rooms in accordance with Title 24, California Code of Regulations, Division 5, Part 5 and the California Plumbing Code (or other relevant section(s) of the currently adopted California Plumbing Code and Title 24, California Code of Regulations); and

2. Building energy conservation systems and temperature control and ventilation systems in accordance with Title 24, California Code of Regulations, Division 5, Chapter 2-53, Part 2.

The final plans, specifications and calculations shall clearly reflect the inclusion of approved criteria, assumptions and methods used to develop the design. In addition, the responsible mechanical engineer shall stamp and sign all plans, drawings and calculations and submit a signed statement to the CBO that the proposed final design plans, specifications and calculations conform with all of the requirements set forth in the Energy Commission's Decision.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of construction of any of the above systems, the project owner shall submit to the CBO the final design plans, specifications and calculations, including a copy of the signed and stamped statement from the responsible mechanical engineer certifying compliance with the applicable edition of the CBC, and send the CPM a copy of the transmittal letter in the next Monthly Compliance Report.

The project owner shall transmit a copy of the CBO's inspection approvals to the CPM in the next Monthly Compliance Report following completion of that increment of construction.

ELEC-1 For the 480 volts and higher systems, the project owner shall not begin any increment of electrical construction until plans for that increment have been approved by the CBO. These plans, together with design changes and design change notices, shall remain on the site for one year after completion of construction. The project owner shall request that the CBO inspect the installation to ensure compliance with the requirements of applicable LORS [1998 CBC, Section 108.4, Approval Required, and Section 108.3, Inspection Requests.] All transmission facilities (lines, switchyards, switching stations, and substations) are handled in Conditions of Certification TSE-1, TSE-2 and TSE-3 in the **Transmission System Engineering** Section of this document.

Protocol: The following activities shall be reported in the Monthly Compliance Report:

- receipt or delay of major electrical equipment; and
- testing or energization of major electrical equipment.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of each increment of electrical construction, the project owner shall submit to the CBO for review and approval the final design plans, specifications and calculations for electrical equipment and systems 480 volts and greater, including a copy of the signed and stamped statement from the responsible electrical engineer attesting compliance with the applicable LORS, and send the CPM a copy of the transmittal letter in the next Monthly Compliance Report.

ELEC-2 The project owner shall submit to the CBO the required number of copies of items A and B for review and approval and one copy of item C [CBC 1998, Section 106.3.2, Submittal documents.] All transmission facilities (lines, switchyards, switching stations, and substations) are handled in Conditions of Certification TSE-1, TSE-2 and TSE-3 in the **Transmission System Engineering** Section of this document.

Protocol: A. Final plant design plans to include:

1. one-line diagrams for the 13.8 kV, 4.16 kV and 480 V systems;
2. system grounding drawings;
3. general arrangement or conduit drawings; and
4. other plans as required by the CBO.

Protocol: B. Final plant calculations to establish:

1. short-circuit ratings of plant equipment;
2. ampacity of feeder cables;
3. voltage drop in feeder cables;
4. system grounding requirements;
5. coordination study calculations for fuses, circuit breakers and protective relay settings for the 13.8 kV, 4.16 kV and 480 V systems;
6. system grounding requirements;
7. lighting energy calculations; and
8. other reasonable calculations as customarily required by the CBO.

Protocol: C. A signed statement by the registered electrical engineer certifying that the proposed final design plans and specifications conform to requirements set forth in the Energy Commission Decision.

Verification: At least 30 days (or a lesser number of days mutually agreed to by the project owner and the CBO) prior to the start of each increment of electrical equipment installation, the project owner shall submit to the CBO for review and approval the final design plans, specifications and calculations, for electrical equipment and systems 480 volts and greater enumerated above, including a copy of the signed and stamped statement from the responsible electrical engineer certifying compliance with the applicable LORS. The project owner shall send the CPM a copy of the transmittal letter in the next Monthly Compliance Report.

REFERENCES

Calpine/Bechtel. 1999a. Application for Certification, Metcalf Energy Center (99-AFC-3). Submitted to the California Energy Commission, April 30, 1999.

Calpine/Bechtel. 1999e. AFC Supplement A, October 1, 1999.

Calpine/Bechtel. 1999f. AFC Supplement B, October 15, 1999.

Calpine/Bechtel. 2000a. AFC Supplement C, February 15, 2000.

POWER PLANT RELIABILITY

Testimony of Steve Baker

INTRODUCTION

In this analysis, staff addresses the reliability issues of the project to determine if the power plant is likely to be built in accordance with typical industry norms for reliability of power generation. Staff uses this level of reliability as a benchmark because the resulting project would likely not degrade the overall reliability of the electric system it serves.

The scope of this power plant reliability analysis covers:

- Equipment availability;
- Plant maintainability;
- Fuel and water availability; and
- Power plant reliability in relation to natural hazards.

Staff examined the project design criteria to determine if the project is likely to be built in accordance with typical industry norms for reliability of power generation. While Calpine/Bechtel has predicted a level of reliability for the power plant (see below), staff believes Calpine/Bechtel should not be held responsible for achieving this goal, so long as the plant's reliability matches or exceeds that of similar plants.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

Presently, there are no laws, ordinances, regulations or standards (LORS) that establish either power plant reliability criteria or procedures for attaining reliable operation. However, the commission must make findings as to the manner in which the project is to be designed, sited and operated to ensure safe and reliable operation (Cal. Code Regs., tit. 20, § 1752(c)). Staff takes the approach that a project is acceptable if it does not degrade the reliability of the utility system to which it is connected. This is likely the case if the project exhibits reliability at least equal to that of other power plants on that system.

SETTING

In the regulated monopoly electric industry of past decades, the utility companies assured overall system reliability, in part, by maintaining a "reserve margin." This amounted to having on call, at all times, sufficient generating capacity, in the form of standby power plants, to quickly handle unexpected outages of generating or transmission facilities. The utilities generally maintained a seven- to ten-percent reserve margin, meaning that sufficient capacity was on call to quickly replace from seven to ten percent of total system resources. This margin proved adequate, in part because of the reliability of the power plants that constituted the system.

Now, in the newly restructured competitive electric power industry, the responsibility for maintaining system reliability falls largely to the California Independent System Operator (Cal-ISO), a newly-formed entity that will work with the California Power Exchange to purchase, dispatch and sell electric power throughout the state. How the Cal-ISO will ensure system reliability is only now being determined; protocols are being developed and put in place that will, it is anticipated, allow sufficient reliability to be maintained under the competitive market system. "Must-run" power purchase agreements and "participating generator" agreements are two mechanisms currently being considered to ensure an adequate supply of reliable power (Mavis 1998, pers. comm.).

The Cal-ISO also requires those power plants selling ancillary services, as well as those holding reliability must-run contracts, to fulfill certain requirements, including:

- filing periodic reports on plant reliability;
- reporting all outages and their causes; and
- scheduling all planned maintenance outages with the Cal-ISO (Detmers 1999, pers. comm.).

The Cal-ISO's mechanisms to ensure adequate power plant reliability apparently are being devised under the assumption that the individual power plants that compete to sell power into the system will each exhibit a level of reliability similar to that of power plants of past decades. However, there is cause to believe that, under free market competition, financial pressures will act to reduce the reliability of many power plants, both existing and newly constructed (McGraw-Hill 1994). It is possible that, if significant numbers of power plants exhibit individual reliability sufficiently lower than this historical level, the assumptions used by Cal-ISO to ensure system reliability will prove invalid, with potentially disappointing results. Until the restructured competitive electric power system has undergone a shakeout period, and the effects of varying power plant reliability are understood and compensated for, staff deems it wise to encourage power plant owners to continue to build and operate their projects to the level of reliability to which all in the industry have become accustomed.

Calpine/Bechtel proposes to operate the Metcalf Energy Center (MEC) as a 600 MW baseload and load following unit operating at output levels from 30 to 100 percent of baseload at an overall annual availability factor between 92 and 98 percent (Calpine/Bechtel 1999a, AFC §§ 1.1, 2.1, 2.2.2, 2.4.1, 10.2.2). Calpine/Bechtel mentions no plans to sell reliability-related power services.

ANALYSIS

A reliable power plant is one that is available when called upon to operate. Achieving this reliability is accomplished by ensuring adequate levels of equipment availability, plant maintainability, fuel and water availability, and resistance to natural hazards. Staff examines these factors for the MEC and compares them to industry norms. If they compare favorably, staff can conclude that the MEC will not degrade utility system reliability.

Throughout its intended life, the project will be expected to perform reliably in baseload and load following duty. Power plant systems must be able to operate for extended periods (sometimes months on end) without shutting down for maintenance or repairs. This requirement for equipment availability is typically addressed by control of quality in machinery design, construction, and installation. Plant reliability is further assured by providing for plant maintainability and sufficient redundancy of critical equipment, fuel and water availability, and resistance to natural hazards.

EQUIPMENT AVAILABILITY

Equipment availability will be ensured by use of appropriate quality assurance/quality control (QA/QC) programs during design, procurement, construction and operation of the plant, and by providing for adequate maintenance and repair of the equipment and systems (discussed below).

The QA/QC program delineated by Calpine/Bechtel (Calpine/Bechtel 1999a, AFC §§ 2.4.5, 2.4.5.2) describes a program typical of the power industry. Equipment and supplies will be purchased from qualified suppliers, suppliers' QA/QC programs will be audited, and construction and installation will be inspected, all in accordance with the QA plan. Staff expects implementation of this program to yield typical reliability of design and construction. To ensure such implementation, staff has proposed appropriate conditions of certification under the portion of this document entitled **Facility Design**.

PLANT MAINTAINABILITY

EQUIPMENT REDUNDANCY

A generating facility called on to operate in baseload and load following service for long periods of time must be capable of being maintained while operating. A typical approach for achieving this is to provide redundant examples of those pieces of equipment most likely to require service or repair.

Calpine/Bechtel plans to provide some redundancy of function (Calpine/Bechtel 1999a, AFC §§ 2.2.5.3, 2.2.13.3, 2.4.2, Table 2.4-1). For example:

- The following plant components are provided in sets of two 100 percent capacity units:
 - HRSG feedwater pumps (one per HRSG; a complete spare pump will be stored on-site);
 - condensate pumps;
 - closed cycle cooling water pumps;
 - closed cycle cooling water heat exchangers;
 - demineralizer/RO system; and
 - battery chargers.
- Circulating water pumps are provided in a set of two 60 percent capacity units.

- The computerized control and protective system for the gas turbine generators and HRSGs, known as the Distributed Control and Information System (DCIS), will exhibit typical redundancy.

While some power plants may exhibit greater levels of equipment redundancy, the fact that the project consists of two parallel trains of gas turbine generators/HRSGs provides inherent reliability. Failure of a non-redundant component of one train should not cause the other train to fail, thus allowing the plant to continue to generate (at reduced output). With this opportunity for continued operation in the face of equipment failure, and in light of the fact that Calpine/Bechtel does not purport to sell system reliability services, staff believes that the equipment redundancy described here represents an adequate design approach.

MAINTENANCE PROGRAM

Calpine/Bechtel proposes to establish a plant maintenance program typical of the industry (Calpine/Bechtel 1999a, AFC §§ 2.4.1, 2.4.5.2). In conjunction with an overall plant quality control program (Calpine/Bechtel 1999a, AFC §§ 2.4.5, 2.4.5.2), staff expects that this will allow the project to be adequately maintained to ensure acceptable reliability.

FUEL AND WATER AVAILABILITY

For any power plant, the long-term availability of fuel and of water for cooling or process use is necessary to ensure reliability. The need for reliable sources of fuel and water is obvious; lacking long-term availability of either source, the service life of the plant may be curtailed, threatening the supply of power as well as the economic viability of the plant.

FUEL AVAILABILITY

The MEC will burn natural gas from a nearby PG&E backbone pipeline, transmitted to the plant via a new one-mile long, sixteen-inch diameter pipeline (Calpine/Bechtel 1999a, AFC §§ 1.1, 2.1.6).

The PG&E natural gas system, which provides access to gas from the Northwest and the Southwest, represents a resource of considerable capacity. This system offers access to far more gas than the plant would require (Calpine/Bechtel 1999a, AFC § 2.4.3). Staff agrees with Calpine/Bechtel's prediction that there will be adequate natural gas supply and pipeline capacity to meet the project's needs.

WATER SUPPLY RELIABILITY

The MEC will obtain recycled water for cooling purposes from the South Bay Water Recycling (SBWR) Program via a new pipeline. Over 80 percent of this water will be consumed in evaporation; the remainder will be returned in the form of wastewater through another new pipeline. Potable water for plant use, as well as for cooling water backup, will be supplied by the San Jose Municipal Water System via a third new pipeline, or alternatively will be drawn from new onsite groundwater wells (Calpine/Bechtel 1999a, AFC §§ 1.1, 1.5.2, 2.1, 2.2.7, 2.2.7.2, 7; Calpine/Bechtel 1999e, §§ 1.0, 1.1, 2.1, 2.2.3).

Using recycled water for plant cooling provides a benefit for the SBWR Program, consuming nearly two million gallons per day through evaporation (Calpine/Bechtel 1999a, AFC § 7.1). This is water that would otherwise have to be dumped into San Francisco Bay. Staff regards this arrangement as an adequately reliable supply. (Please refer to that portion of this document entitled **Soil and Water Resources**.)

POWER PLANT RELIABILITY IN RELATION TO NATURAL HAZARDS

Natural forces can threaten the reliable operation of a power plant. High winds, tsunamis (tidal waves) and seiches (waves in inland bodies of water) will not likely represent a hazard for this project, but flooding and seismic shaking (earthquake) present credible threats to reliable operation (see that portion of this document entitled **Facility Design**).

FLOODING

Flooding should not present a serious threat to plant reliability, as the project site lies outside a 100-year flood zone (Calpine/Bechtel 1999a, AFC § 2.3.1). Proper site design and grading will provide adequate protection from flooding. These topics are covered under the **Geology** and **Facility Design** portions of this document.

SEISMIC SHAKING

The site lies within Seismic Zone 4. The project will be designed and constructed to the latest appropriate LORS. Compliance with current LORS applicable to seismic design represents an upgrading of performance during seismic shaking, compared to older facilities, due to the fact that these LORS have been periodically and continually upgraded. (Please see that section of this document entitled **Facility Design**.) By virtue of being built to the latest seismic design LORS, this project will likely perform at least as well as, and perhaps better than, existing plants in the electric power system. In light of the historical performance of California power plants and the electrical system in seismic events, staff believes there is no special concern with power plant functional reliability affecting the electric system's reliability due to seismic events.

COMPARISON WITH EXISTING FACILITIES

Industry statistics for availability factors (as well as many other related reliability data) are kept by the North American Electric Reliability Council (NERC). NERC continually polls utility companies throughout the North American continent on project reliability data through its Generating Availability Data System (GADS), and periodically summarizes and publishes the statistics on the Internet (<http://www.nerc.com>). NERC reports the following summary generating unit statistics for the years 1993 through 1997 (NERC 1998):

For Combined Cycle units (All MW sizes)

Availability Factor = 91.10 percent

The Siemens-Westinghouse gas turbines that will be employed in the project have been on the market for several years now, and can be expected to exhibit typically high availability. Calpine/Bechtel's prediction of an annual availability factor from 92 to 98 percent (Calpine/Bechtel 1999a, AFC §§ 2.2.2, 2.2.2.16, 2.4.1) is not unreasonable compared to the NERC figure for similar plants throughout North America (see above). In fact, these new, large machines can well be expected to outperform the fleet of various gas turbines that make up the NERC statistics. Further, since the plant will consist of two parallel gas turbine generating trains, maintenance can be scheduled during those times of year when the full plant output is not required to meet market demand, typical of industry standard maintenance procedures (Calpine/Bechtel 1999a, AFC §§ 2.4.1, 2.4.5.2). This practice holds out the promise of adequately high plant availability. Calpine/Bechtel's estimate of plant availability therefore appears realistic. The stated procedures for assuring design, procurement and construction of a reliable power plant appear to be in keeping with industry norms, and staff believes they are likely to yield an adequately reliable plant.

FACILITY CLOSURE

Closure of the facility, whether planned or unplanned, cannot impact project reliability. Reliability impacts on the electric system from facility closure, should there be any, are dealt with in that portion of this document entitled **Transmission System Engineering**.

RESPONSE TO PUBLIC AND AGENCY COMMENTS

There was one comment on the Power Plant Reliability section of the Preliminary Staff Assessment. In its written comments on staff's PSA, the applicant noted that the amount of water that will be evaporated during plant cooling has changed from 20 to 35 percent to over 80 percent. This change is reflected above under the section entitled "Water Supply Reliability." It does not influence the conclusion below.

There were no other relevant public or agency comments on the Power Plant Reliability section of the Preliminary Staff Assessment.

CONCLUSION

Calpine/Bechtel predicts an equivalent availability factor from 92 to 98 percent, which staff believes is achievable in light of the industry norm of 91 percent for this type of plant. Based on a review of the proposal, staff concludes that the plant will be built and operated in a manner consistent with industry norms for reliable operation. This should provide an adequate level of reliability.

REFERENCES

- Detmers, Jim. 1999. Director of Maintenance and Reliability, California Independent System Operator. Interview with Steve Baker (California Energy Commission), July 13, 1999.
- Calpine/Bechtel. 1999a. Application for Certification, Metcalf Energy Center (99-AFC-3). Submitted to the California Energy Commission, August 30, 1999.
- Calpine/Bechtel. 1999e. AFC Supplement A, October 1, 1999.
- Mavis, Steve. 1998. Transmission Planner, California Independent System Operator. Telephone conversation with Steve Baker (California Energy Commission), January 23, 1998.
- McGraw-Hill (McGraw-Hill Energy Information Services Group). 1994. *Operational Experience in Competitive Electric Generation, an Executive Report*, 1994.
- NERC (North American Electric Reliability Council). 1998. 1993-1997 Generating Availability Report.

POWER PLANT EFFICIENCY

Testimony of Steve Baker

INTRODUCTION

The Energy Commission makes findings as to whether energy use by the Metcalf Energy Center (MEC) will result in significant adverse impacts on the environment, as defined in the California Environmental Quality Act (CEQA). If the Energy Commission finds that the MEC's consumption of energy creates a significant adverse impact, it must determine whether there are any feasible mitigation measures that could eliminate or minimize the impacts. In this analysis, staff addresses the issue of inefficient and unnecessary consumption of energy.

In order to support the Energy Commission's findings, this analysis will:

- determine whether the facility will likely present any adverse impacts upon energy resources;
- determine whether these adverse impacts are significant; and if so,
- determine whether feasible mitigation measures exist that would eliminate the adverse impacts, or reduce them to a level of insignificance.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

FEDERAL

No federal laws apply to the efficiency of this project.

STATE

CALIFORNIA ENVIRONMENTAL QUALITY ACT GUIDELINES

CEQA Guidelines state that the environmental analysis "...shall describe feasible measures which could minimize significant adverse impacts, including where relevant, inefficient and unnecessary consumption of energy" (Cal. Code Regs., tit. 14, § 15126.4(a)(1)). Appendix F of the Guidelines further suggests consideration of such factors as the project's energy requirements and energy use efficiency; its effects on local and regional energy supplies and energy resources; its requirements for additional energy supply capacity; its compliance with existing energy standards; and any alternatives that could reduce wasteful, inefficient and unnecessary consumption of energy (Cal. Code regs., tit. 14, § 15000 et seq., Appendix F).

LOCAL

No local or county ordinances apply to power plant efficiency.

SETTING

Calpine/Bechtel proposes to construct and operate a (nominal) 600 MW combined cycle power plant to generate baseload and load-following power (Calpine/Bechtel 1999a, AFC §§ 2.2.16, 2.4.1, 9.5.1, 10.2.2). The MEC will consist of two Siemens-Westingshouse F-class combustion turbine generators with evaporative inlet air coolers and steam injection producing approximately 200 MW each, two heat recovery steam generators (HRSGs) with duct burners, and one 235 MW reheat steam turbine generator, totaling approximately 600 MW (Calpine/Bechtel 1999a, AFC §§ 1.1, 2.2.2, 2.2.3, 2.2.4.1, 2.2.4.2).

ANALYSIS

ADVERSE IMPACTS ON ENERGY RESOURCES

The inefficient and unnecessary consumption of energy, in the form of non-renewable fuels such as natural gas and oil, constitutes an adverse environmental impact. An adverse impact can be considered significant if it results in:

- adverse effects on local and regional energy supplies and energy resources;
- a requirement for additional energy supply capacity;
- noncompliance with existing energy standards; or
- the wasteful, inefficient and unnecessary consumption of fuel or energy.

PROJECT ENERGY REQUIREMENTS AND ENERGY USE EFFICIENCY

Any power plant large enough to fall under Energy Commission siting jurisdiction will consume large amounts of energy. The MEC will burn natural gas at a maximum rate exceeding 80 billion Btu per day (Calpine/Bechtel 1999a, AFC Fig. 2.2-4; Calpine/Bechtel 1999h, Data Response #40¹). This is a substantial rate of energy consumption, and holds the potential to impact energy supplies.

Under expected project conditions, electricity will be generated at a peak load efficiency of approximately 52.3 percent LHV² (Calpine/Bechtel 1999a, AFC Fig. 2.2-4; Calpine/Bechtel 1999h, Data Response #40); compare this to the average fuel efficiency of a typical utility company baseload power plant at approximately 35 percent LHV.

ADVERSE EFFECTS ON ENERGY SUPPLIES AND RESOURCES

Calpine/Bechtel has described its sources of supply of natural gas for the MEC (Calpine/Bechtel 1999a, AFC § 1.1, 2.1, 2.4.3, 6). The project will burn natural gas from a PG&E backbone pipeline that lies to the east of Highway 101. The existing PG&E gas supply infrastructure is extensive, offering access to gas from the Northwest and Southwest. These sources represent far more gas than would be

¹ Note: This data response erroneously reported a fuel consumption rate that was too low by a factor of 1,000.

² Lower heating value.

required for a project this size. It is therefore highly unlikely that the MEC could pose a substantial increase in demand for natural gas in California.

ADDITIONAL ENERGY SUPPLY REQUIREMENTS

Natural gas fuel will be supplied to the project via a new one-mile long, 16-inch diameter pipeline from the existing PG&E backbone pipeline east of Highway 101 (Calpine/Bechtel 1999a, AFC § 2.1.6). The natural gas supply system in California is so large and well-established, there is no real likelihood that the MEC will require development of new sources of energy.

COMPLIANCE WITH ENERGY STANDARDS

No standards apply to the efficiency of the MEC or other non-cogeneration projects.

ALTERNATIVES TO REDUCE WASTEFUL, INEFFICIENT AND UNNECESSARY ENERGY CONSUMPTION

The MEC could be deemed to create significant adverse impacts on energy resources if alternatives existed that would reduce the project's use of fuel. Evaluation of alternatives to the project that could reduce wasteful, inefficient or unnecessary energy consumption first requires examination of the project's energy consumption. Project fuel efficiency, and therefore its rate of energy consumption, is determined by the configuration of the power producing system and by the selection of equipment used to generate power.

PROJECT CONFIGURATION

The MEC will be configured as a compound-train combined cycle power plant, in which electricity is generated by two gas turbines, and additionally by a reheat steam turbine that operates on heat energy recuperated from the gas turbines' exhaust. By recovering this heat, which would otherwise be lost up the exhaust stacks, the efficiency of any combined cycle power plant is increased considerably from that of either gas turbines or steam turbines operating alone. Such a configuration is well suited to the large, steady loads met by a baseload plant, intended to supply energy efficiently for long periods of time.

The number of turbines further contributes to efficiency at part load. Gas turbine generators operate most efficiently at one particular output level, typically at full load. Whenever desired output is less than full load, the unit must be throttled back. Rather than being forced to throttle back one large turbine, with the consequent reduction in efficiency, the power plant operator will have the option of shutting off one gas turbine. This allows the plant to generate at less than full load while maintaining optimum efficiency, suitable for a plant meant for flexible generation, such as load-following duty. Loads down to 50 percent of full load allow one gas turbine, operating at full load, and the steam turbine to maintain peak efficiency.

Additionally, for further operational flexibility, the HRSGs will be equipped with duct burners, to supply additional steam to be injected into the gas turbines for power augmentation (Calpine/Bechtel 1999a, AFC §§ 2.2.2, 2.2.4). This increases

maximum power output, and extends the range of power outputs at which the plant can operate at optimum or near optimum efficiency.

EQUIPMENT SELECTION

Modern gas turbines embody the most fuel-efficient electric generating technology available today. The “F-class” gas turbines to be employed in the MEC represent some of the most modern and efficient such machines now available. Calpine/Bechtel will employ a combined cycle power train from a prominent manufacturer, the Siemens-Westinghouse 501F, nominally rated in a two-on-one train combined cycle at 546 MW and 55.8 percent efficiency LHV at ISO³ conditions (Calpine/Bechtel 1999a, AFC § 2.2.4.1; GTW 1998).⁴

A possible alternative is the General Electric Frame 7FA, another F-class gas turbine nominally rated at 530 MW and 56.5 percent efficiency at ISO conditions in two-on-one train combined cycle configuration (GTW 1998). This machine is effectively identical to the machine chosen.

Another possible alternative is the ASEA Brown-Boveri (ABB) KA-24, still another “F-class” machine. While the KA-24 promises slightly higher fuel efficiency (57.9 percent) (GTW 1998) than the other F-class machines, any differences among the three in actual operating efficiency will be insignificant. Selecting among these machines is thus based on other factors, such as generating capacity, cost, ability to meet air pollution limitations, and commercial availability. The ABB machine, for instance, is available only in one-on-one power trains, with one gas turbine and one steam turbine paired on a single shaft generating a nominal 271 MW (Orsini 1999, pers. comm.). The GE and Siemens-Westinghouse machines, which can be configured more flexibly, offer some advantages.

EFFICIENCY OF ALTERNATIVES TO THE PROJECT

The project objectives include generation of baseload or load following electricity, as market conditions dictate (Calpine/Bechtel 1999a, AFC §§ 2.2.16, 2.4.1, 9.5.1, 10.3).

Alternative Generating Technologies

Calpine/Bechtel addresses alternative generating technologies in its application (Calpine/Bechtel 1999a, AFC § 9.5). Oil-burning, coal-burning, nuclear, solar, wind, hydroelectric, biomass, ocean energy conversion, municipal solid waste, fuel cells and geothermal technologies are all considered. Given the project objectives, location and air pollution control requirements, staff agrees with Calpine/Bechtel that only natural gas-burning technologies are feasible.

³ International Standards Organization (ISO) standard conditions are 15°C (59°F), 60 percent relative humidity, and one atmosphere of pressure (equivalent to sea level).

⁴ Nominal, or expected, maximum plant output of approximately 600 MW is greater than this figure, due to the incorporation of duct burners and steam injection.

Natural Gas-Burning Technologies

Fuel consumption is one of the most important economic factors in selecting an electric generator; fuel typically accounts for over two-thirds of the total operating costs of a fossil-fired power plant (Power 1994). Under a competitive power market system, where operating costs are critical in determining the competitiveness and profitability of a power plant, the plant owner is thus strongly motivated to purchase fuel efficient machinery.

Capital cost is also important in selecting generating machinery. Recent progress in the development of large, stationary gas turbines, aided by the incorporation into these machines of technological advances made in the development of aircraft jet engines, has created a situation in which several large manufacturers compete vigorously to sell their machines. This, combined with the cost advantages of assembly-line manufacturing, has driven down the prices of these machines. Thus, the power plant developer can purchase a turbine generator that not only offers the best available fuel efficiency, but at the same time sells for the lowest per-kilowatt capital cost.

One possible alternative to an F-class gas turbine is the Siemens-Westinghouse 501G gas turbine generator, which employs partial steam cooling to allow slightly higher temperatures, yielding greater efficiency. While the 501G is rated at 58 percent efficiency, 2.2 percent higher than the 501F, the G machine produces 367 MW to the 501F's 272 MW; a 600 MW power plant would thus not be practical. Instead, a single 501G would yield a 367 MW (nominal) plant, while a dual arrangement would yield a 726 MW plant. Additionally, the 501G is brand new; the first such machine is now in startup at a site in Florida owned by Lakeland Electric and Water (Power 1999). Given the minor efficiency improvement promised by the G-class turbine, the likelihood that the plant will frequently be dispatched at less than full load, and the lack of a proven track record for the 501G, Calpine/Bechtel's decision to purchase "F-class" machines is a reasonable one.

A further choice of alternatives involves the selection of gas turbine inlet air cooling methods. The two commonly used techniques are the evaporative cooler and the chiller; both devices increase gas turbine power output by cooling the gas turbine inlet air. A chiller can offer greater power output than the evaporative cooler on hot, humid days, but consumes electric power to operate its refrigeration process, thus slightly reducing overall net power output and, thus, overall efficiency. An evaporative cooler boosts power output best on dry days; it uses less electric power than a chiller, thus yielding slightly higher operating efficiency. The difference in efficiency between these two techniques is so small as to be insignificant. Calpine/Bechtel plans to install evaporative cooling (Calpine/Bechtel 1999a, AFC § 2.2.4.1). Given project climate and the relative lack of clear superiority of one system over the other, staff deems this an approach that will yield no adverse energy impacts.

In conclusion, the project configuration (combined cycle) and generating equipment ("F-class" gas turbines) chosen appear to represent the most efficient feasible

combination to satisfy the project objectives. There are no alternatives that could significantly reduce energy consumption.

CUMULATIVE IMPACTS

There are no nearby power plant projects that hold the potential for cumulative efficiency impacts when aggregated with the MEC.

FACILITY CLOSURE

Closure of the facility, whether planned or unplanned, will not influence, nor will it be influenced by, project efficiency. Any efficiency impacts due to closure of the project would be on the electric system as a whole. Yet the vast size of the electric system serving California, the number of generating plants offering to sell power into it, and the existence of the California Independent System Operator and Power Exchange to ensure the efficient management of the system, all lend assurance that closure of this facility will not produce significant adverse impacts on efficiency.

RESPONSE TO PUBLIC AND AGENCY COMMENTS

At the PSA Workshop held in San Jose on June 20, 2000, an intervenor suggested the applicant consider fueling the project with liquefied natural gas (LNG). This suggestion was not seriously considered, as cost considerations alone make it infeasible. Further, transporting the necessary quantities of LNG to the project site could create an unreasonable safety hazard.

Intervenor Williams voiced concern that PG&E's gas transmission line would be shut down during interconnection of the line supplying the project, thus interrupting gas service to much of California. Staff explained to him that this interconnection is accomplished as a "hot tap," in which the tap line is connected to the main line without interrupting service.

There were no further public or agency comments on the Power Plant Efficiency section of the Preliminary Staff Assessment.

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

The MEC, if constructed and operated as proposed, would generate 600 MW of electric power at an overall project fuel efficiency of approximately 52 percent. While it will consume substantial amounts of energy, it will do so in the most efficient manner practicable. It will not create significant adverse effects on energy supplies or resources, will not require additional sources of energy supply, and will not consume energy in a wasteful or inefficient manner. No energy standards apply to the project. Staff therefore concludes that the MEC would present no significant adverse impacts upon energy resources.

No cumulative impacts on energy resource are likely. Facility closure would not likely present significant impacts on electric system efficiency.

RECOMMENDATION

From the standpoint of energy efficiency, staff recommends certification of the MEC. No Conditions of Certification are proposed.

REFERENCES

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TRANSMISSION SYSTEM ENGINEERING

Testimony of Linda Davis and Al McCuen

INTRODUCTION

The Transmission System Engineering (TSE) analysis provides the basis for the findings in the California Energy Commission's (Commission) decision. This final staff analysis (FSA) indicates whether or not the transmission facilities associated with the proposed project conform to all applicable laws, ordinances, regulations and standards (LORS) required for safe and reliable electric power transmission.

The Calpine Corporation and Bechtel Enterprises, Inc. (Calpine/Bechtel), the applicant, proposes to connect their project, the Metcalf Energy Center Project (MEC) to Pacific Gas & Electric Company's (PG&E) transmission system. The California Independent System Operator (Cal-ISO) is responsible for ensuring electric system reliability for all participating transmission owning utilities and determines both the standards necessary to achieve reliability and whether a proposed project conforms with those standards. The Energy Commission will rely on the Cal-ISO's determinations to make its finding related to applicable reliability standards and the need for additional transmission facilities. The Cal-ISO will also provide independent testimony for the Energy Commission's hearings.

Staff's analysis also evaluates the power plant switchyard, outlet line, termination facilities and outlet alternatives identified by the applicant and provides proposed conditions of certification to ensure that the project complies with applicable LORS during the design, construction, operation and potential closure of the project.

Public Resources Code Section 25523 requires the Energy Commission to "prepare a written decision...which includes: ...findings regarding conformity of the proposed site and related facilities...with public safety standards...and with other relevant local, regional, state, and federal standards, ordinances, and laws." Under the California Environmental Quality Act (CEQA) the Energy Commission must conduct an environmental review of the "whole of an action," which may include facilities ancillary to the project that are not licensed by the Energy Commission (Cal. Code Regs., tit. 14, §15378). Therefore, the Energy Commission makes reasonable attempts to identify and evaluate the environmental effect of construction and operation of any new or modified transmission facilities beyond the project's interconnection with the existing transmission system that are required as a result of the power plant addition to the California transmission system.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS

- California Public Utilities Commission (CPUC) General Order 95 (GO-95), "Rules for Overhead Electric Line Construction," formulates uniform requirements for construction of overhead lines. Compliance with this order ensures adequate service and safety to persons engaged in the construction,

maintenance, operation or use of overhead electric lines and to the public in general.

- CPUC Rule 21 provides standards for the reliable connection of parallel generating stations connected to participating transmission owners facilities.
- Western Systems Coordinating Council (WSCC) Reliability Criteria provides the performance standards used in assessing the reliability of the interconnected system. These Reliability Criteria require the continuity of service to loads as the first priority and preservation of interconnected operation as a secondary priority. The WSCC Reliability Criteria includes the Reliability Criteria for Transmission System Planning, Power Supply Design Criteria, and Minimum Operating Reliability Criteria. Analysis of the WSCC system is based to a large degree on WSCC Section 4 "Criteria for Transmission System Contingency Performance" which requires that the results of power flow and stability simulations verify established performance levels. Performance levels are defined by specifying the allowable variations in voltage, frequency and loading that may occur on systems other than the one in which a disturbance originated. Levels of performance range from no significant adverse effect outside a system area during a minor disturbance (loss of load or facility loading outside emergency limits) to a performance level that only seeks to prevent system cascading and the subsequent blackout of islanded areas during major disturbances (such as loss of all lines in a right of way). While controlled loss of generation, load, or system separation is permitted in extreme circumstances, their uncontrolled loss is not permitted (WSCC 1998).
- North American Electric Reliability Council (NERC) Planning Standards provides policies, standards, principles and guidelines to assure the adequacy and security of the electric transmission system. With regard to power flow and stability simulations, these Planning Standards are similar to WSCC's Criteria for Transmission System Contingency Performance. The NERC planning standards provide for acceptable system performance under normal and contingency conditions, however the NERC planning standards apply not only to interconnected system operation but also to individual service areas (NERC 1998).
- Cal-ISO Reliability Criteria also provide policies, standards, principles and guidelines to assure the adequacy and security of the electric transmission system. With regard to power flow and stability simulations, these Planning Standards are similar to WSCC's Criteria for Transmission System Contingency Performance and the NERC Planning Standards. The Cal-ISO Reliability Criteria incorporate the WSCC Criteria and NERC Planning Standards. However, the Cal-ISO Reliability Criteria also provide some additional requirements that are not found in the WSCC Criteria or the NERC Planning Standards. The Cal-ISO Reliability Criteria apply to all existing and proposed facilities interconnecting to the Cal-ISO controlled grid.
- Cal-ISO Scheduling Protocols and Dispatch Protocols require conformance with NERC, WSCC, and Local Area Reliability and Planning Criteria. These standards will be applied the assessment of the system reliability implications of the project. Also of major importance to the project, which may sell through the

California Power Exchange (Cal-PX) are the Cal-ISO Day/Hour Ahead Inter-zonal Congestion Management Scheduling Protocol (SP 10), the Transmission System Loss Management Scheduling Protocol (SP 4), and the Creation of the Real Time Merit Order Stack (SP 11). The Congestion Management Scheduling Protocol provides that the operation of power plants not violate system criteria when market participants request generation dispatch or the use of major interties. The Real Time Merit Order Stack is developed based on increasing energy bid prices so that the least cost bids are accepted early on and if congestion is anticipated the highest bids are not selected. The Transmission System Loss Management Scheduling Protocol uses the Cal-ISO power flow model to identify the effects on total transmission losses at each generating unit and scheduling point. Additional calculations are performed to the actual net power output required by the generating units meet their scheduled obligations (Cal-ISO 1998b, Cal-ISO 1998c).

- Cal-ISO Participating Generator Agreement consists of detailed explanations of the requirements in the Cal-ISO Tariff pertaining to the paralleled generating unit.

PROJECT DESCRIPTION

The MEC will provide a nominal electrical output of 600 megawatts (MW) by connecting two combustion turbine generators and one steam turbine generator to the PG&E system. The site is at the southern edge of the City of San Jose in Santa Clara County, partially within the city limits. The MEC site is approximately 2,000 feet southwest of the PG&E Metcalf substation (MEC 1999a, pages 2 and 3).

The applicant plans to construct a 230 kilovolt (kV) (see Definition of Terms) switchyard and approximately 240 feet of an overhead double circuit 230 kV transmission line. The short new lines form a new loop-in of the existing PG&E Metcalf to Monta Vista No. 4, 230 kV transmission line into the new MEC switchyard. The new double circuit overhead line will exit the MEC switchyard, cross over a small area of the plant site, extend over Fisher Creek and tie into the existing transmission corridor through modification of the existing Metcalf to Monta Vista No. 4 transmission line. The loop will extend approximately 240 feet and tie into the existing line through modification of Tower 0/6, which is the most southern transmission tower in the existing corridor (MEC 1999a, pages 5-1 and 5-4). No new right of way for the overhead segment will be purchased, as PG&E property and the MEC site are adjacent (MEC 1999b, page 19).

The MEC project will access the California market through PG&E's Metcalf to Monta Vista No. 4 transmission line. The Cal-ISO, after review of the Detailed Facilities Study, required Supplemental Studies to define parameters and potential impacts of the project not addressed in the Detailed Facilities Study (Cal-ISO 1999). The project parameters did not change significantly as a result of the analysis of the Supplemental Studies.

The power plant switchyard is located at the project site. The project switchyard will consist of one 230-13.8 kV power transformer and nine 230 kV circuit breakers. A

breaker-and-half arrangement will be used to provide reliability. All switchyard equipment will be designed for a 63,000 amp interrupting capacity. The main busses and bays will be designed for 3,000 amp continuous current (MEC 1999a, page 5-4).

The proposed line will be a 230 kV double circuit line overhead extending 240 feet from the take off towers located inside the MEC switchyard to existing tower No.0/6 of the Metcalf to Monta Vista No. 4 line, which is located in the existing PG&E corridor adjacent to the site. The circuit functions as a loop and adds no additional transmission capacity to the Metcalf to Monta Vista circuit. The take off towers will be spaced approximately 50 feet apart. Each phase of the two three-phase lines will be made of bundled 2,300 kilo-circular-mills (KCM) all aluminum conductor (AAC), named "2300 AAC" which is a standard PG&E conductor that is presently installed for the Metcalf to Monta Vistas No. 4 transmission line, and therefore is required for the MEC loop. The normal rating for the bundled conductor at 230 kV is 1,106 mega-volt-amperes (MVA) or about 1,083 megawatts (MW), assuming a 0.98 power factor (MEC 1999b, page 19).

EXISTING FACILITIES AND RELATED SYSTEMS

Transmission system engineering Figure 1 and Figure 2 (attached) depict transmission located near the MEC project site. Specific facilities in close proximity to the interconnection include:

- PG&E's Metcalf substation is located 0.5 miles northeast of the site. Metcalf substation is connected to the following PG&E lines: 500 kV Metcalf-Tesla and Metcalf-Moss Landing lines, the two Metcalf-Newark and two Metcalf-Moss Landing 230 kV lines, the four Metcalf-Monta Vista 230 kV lines, and two 115 kV lines each from Metcalf to El Patio, Edenvale, Newark and Evergreen and one 115 kV line each from Metcalf to Morgan Hill, Green Valley and the Coyote Pumping Plant.
- PG&E's transmission corridor is located adjacent to the north MEC site boundary. The lines in the corridor are the 500 kV Metcalf-Moss Landing, the four 230 kV Metcalf-Monta Vista lines and two 115 kV Metcalf-El Patio lines.

SYSTEM RELIABILITY

A system reliability study, called a Preliminary Facilities Study (or System Impact Study), is performed to determine the effects of connecting a new power plant to the existing electric grid. The study identifies impacts and also identifies how negative impacts can be eliminated. Any new transmission outlet facilities, or downstream facilities, required for connection to the grid are considered part of the project and are subject to the full AFC review process.

Completion of the Detailed Facilities Study, the Commission's approval, and the issuance of the Cal-ISO's final interconnection approval will assure conformance with NERC, WSCC, and Cal-ISO reliability criteria. The Cal-ISO will provide testimony at Energy Commission hearings for the project.

A system reliability evaluation determines whether the new project would cause thermal overloads, voltage violations (voltages too high or low), and/or electric system instability (excessive oscillations). In addition to the above analysis, studies may be performed to verify that sufficient reactive power (see Definition of Terms) is available. The reliability evaluation must be conducted for all credible "emergency" conditions. Emergency conditions could include the loss of a single or double circuit line, the loss of a transformer or generator, or a combined loss of these facilities. A Preliminary Facilities Study is conducted in advance of potential system changes, such as the addition of the project into the system, in order to prevent criteria violations. The criteria used in this evaluation include the WSCC Planning Criteria, NERC Planning Standards and Cal-ISO reliability criteria.

SCOPE OF RELIABILITY STUDIES

PG&E performed power flow, short circuit and stability studies with and without insertion of the MEC into the system to determine conformance with reliability criteria. The PG&E Detailed Facilities Study Report and Supplemental Studies show that power delivered from the MEC project to the existing Metcalf substation will affect power flows on existing transmission lines in the region. Interconnecting through a loop-in of the Metcalf-Monta Vista 230 kV No. 4 circuit to PG&E's electric grid results in the MEC project affecting flows on the line and at Metcalf substation. Power flow studies were based on the assumption that the project would be completed and generating power in the summer of 2002. The project completion date is now expected to occur in 2003. The transmission system upgrades planned for this period that will be installed by 2003 are expected to result in a more robust system to accommodate the MEC. As a result the 2002 cases used as a basis for the studies are considered valid for the purpose of the ISO and TSE analysis which is to evaluate the effects of MEC for three cases (MEC 1999b, page 8) as follows:

1. PG&E's Heavy summer 2002 base case
2. PG&E's Summer off peak 2002 base case
3. Year 2002 South (San Francisco) Bay stress case

California transmission system cases listed above were employed to evaluate the effect of inserting project power into the existing system. The study identified normal and contingency impacts. The study results provide snapshots of highly stressed operation and are not illustrative of month to month or day to day operation.

POWER FLOW STUDY RESULTS

Based on the PG&E Detailed Facilities Study, the Supplemental Studies, and the comments and recommendations of the Cal-ISO, and review of the expected system configuration and load increases for 2003, staff believes that the MEC project will be interconnected to the existing system in accordance with reliability criteria. Significant new or modified downstream facilities are not required to accommodate the project. Based on the Detailed Facility Studies and Supplemental Studies, the Cal-ISO has granted preliminary approval to the interconnection (Cal-ISO 2000a). Additional studies requested by the Cal-ISO to refine the analysis, including the impact of the change from the 2002 to the 2003 on line date, are not

expected to identify the need for any new transmission facilities beyond those discussed in this analysis and the MEC AFC.

Conformance verification with reliability criteria and interconnection standards will be assessed in the Commission's Compliance and Monitoring Process (see Conditions of Certification TSE 1, 2 and 3). Staff's proposed conditions of certification require the studies performed in response to Attachment A of the preliminary approval letter and an executed Interconnection Agreement between MEC and PG&E. As a practical matter, staff anticipates that any studies performed by the CEC, PG&E and/or the Cal-ISO in response to the change in on line date will be available near the end of the siting process.

SYSTEM IMPACTS

System impacts were found to be acceptable for the MEC project under normal operating conditions. No overloaded facility was found under normal operating conditions (MEC 1999b, page 7).

System sensitivity studies under contingency conditions were also analyzed. No overloaded facility was found following single contingencies (MEC 1999b, page 7).

SHORT CIRCUIT STUDY RESULTS

Short circuit analyses are conducted to assure that existing and proposed breaker ratings are sufficient to withstand high levels of current during a fault (such as when a line touches the ground). The addition of a generation unit to the grid can significantly increase the level of current that flows through circuit breakers. The acceptability of breaker ratings can also be determined during the compliance phase; it need not be done during the AFC process.

The switchyard components will be rated in accordance with the results of a short-circuit study. The short-circuit study was completed by PG&E in MEC's Detailed Facilities Study based on parameters provided by the applicant. The short circuit study results did not indicate any overstressed equipment (MEC 1999b, page 10). The acceptability of breaker ratings will be verified during the compliance phase of the certification process. Condition of certification TSE-1b will ensure compliance and is recommended to ensure that breaker ratings will be adequate to interrupt post-project fault currents.

STABILITY STUDY RESULTS

Stability studies were performed to ensure that the transmission system remains stable during normal and abnormal operating conditions with the project connected to the system. For all the simulations, the transmission network remained stable with the addition of the MEC connected to the Metcalf-Monte Vista No. 4 circuit. (MEC 1999b, page 11).

CAL-ISO REVIEW

The Cal-ISO has reviewed the Detailed Facilities Study and Supplemental Studies for the MEC project. Considering the comments of the ISO, CEC staff does not

anticipate the need for any new major facilities beyond those identified to be located at the site, within the existing transmission corridor adjacent to the site, and those within the fence lines of the Metcalf and Monta Vista substations. The Cal-ISO review of the Detailed Facilities Study and the Supplemental Studies resulted in preliminary interconnection approval by the Cal-ISO. CEC staff concludes that no significant additional new facilities are needed to accommodate the MEC. The Cal-ISO provided a letter of support regarding the benefits of local generation for the San Jose area. (Cal-ISO 2000b). The Cal-ISO will give its final approval to the project after reviewing additional information requested by the Cal-ISO listed in Attachment A to the preliminary interconnection approval letter, referred to in this analysis as the Attachment A studies (Cal-ISO 2000a).

ALTERNATIVES

This section addresses transmission alternatives studied for the proposed site. Alternative site analysis is presented in the Alternatives section of the staff assessment. Five different transmission line alternatives were considered for the Metcalf site. The four alternatives that were dropped include transmission alternatives one through four.

- Alternative 1: This transmission alternative involves directly connecting three MEC step up transformers in the MEC switchyard to the 230 kV bus at the PG&E Metcalf substation. Staff concludes that costs and environmental impacts of this alternative are considered to be higher than the proposed interconnection.
- Alternative 2: This transmission alternative involves looping into the existing Metcalf to Moss Landing 500 kV transmission line. Construction of 500 kV facilities is more costly than 230 kV construction, staff concludes that the costs and environmental impacts are considered to be higher than the proposed interconnection.
- Alternative 3: This transmission alternative involves looping into the existing 230 kV transmission lines in the same corridor as the Metcalf to Monta Vista No. 4 circuit by crossing under that circuit and others in the corridor. This might require underground cable systems or cross several 115 kV and 230 kV lines, decreasing reliability. Staff concludes that the reliability impacts and costs of this alternative are inferior to the preferred interconnection.
- Alternative 4: This transmission alternative involves looping into the existing 115 kV transmission lines in the same corridor as the Metcalf to Monta Vista No. 4 circuit or by connecting directly to the 115 kV bus at Metcalf substation. This alternative would require relocation or crossing over of lines in the corridor increasing costs and decreasing reliability. Staff concludes that the reliability impacts and complexity of this alternative are greater than that of the preferred alternative.

FACILITY CLOSURE

The parallel operation of generating stations is controlled, in part by CPUC Rule 21. This rule and standard utility practices for interconnecting a generating unit provide for the participating transmission owner (PTO) to have control of breakers and disconnect switches where the outlet line terminates (the Three Mountain Power plant switchyard) and general control over the interconnected generators. Prior to construction and interconnection of a generating unit, the PTO reviews and comments on the plans and specifications for the power plant and termination equipment that is important to safe and reliable parallel operation and inspects the interconnection facilities. Contractual provisions may be developed to provide backup or other power service and codify procedures to be followed during parallel operation. Before generating stations are permitted to bid into the Cal-PX and be dispatched by the Cal-ISO, generator standards must be met and the generating station must commit to comply with instructions of the Cal-ISO dispatchers. All participating generators must sign a Participating Generator Agreement (Cal-ISO 1998a, Cal-ISO 1998b). Procedures for planned, unexpected temporary closure and unexpected permanent closure must be developed or verified to facilitate effective communication and coordination between the generating station owner, PTO and the Cal-ISO to ensure safety and system reliability.

CPUC General Order 95, Rule 31.6 requires that “lines or portions of lines permanently abandoned shall be removed by their owners so that such lines shall not become a public nuisance or a hazard to life or property.” Condition of certification TSE-1c requires compliance with this rule.

The ability of the above LORS to reasonably assure safe and reliable conditions in the event of facility closure was evaluated for three scenarios:

PLANNED CLOSURE

This type of closure occurs in a planned and orderly manner such as at the end of its useful economic or mechanical life or due to gradual obsolescence. Under such circumstances the requirement for the owner to provide a closure plan 12 months prior to closure in conjunction with applicable LORS is considered sufficient to provide adequately for safety and reliability. For instance, a planned closure provides time for the owner to coordinate with the PTO to assure (as one example) that the PTO’s system will not be closed into the outlet thus energizing the power plant switchyard. Alternatively, the owner may coordinate with the PTO to maintain some power service via the outlet line to supply critical station service equipment or other loads .

UNEXPECTED TEMPORARY CLOSURE

This unplanned closure occurs when the facility is closed suddenly and/or unexpectedly for a short term due to unforeseen circumstances such as a natural or other disaster or emergency. During such a closure the facility cannot insert power into the utility system. Closures of this sort can be accommodated by establishment of an on-site contingency plan (see General Conditions Including Compliance Monitoring and Closure Plan).

UNEXPECTED PERMANENT CLOSURE

This unplanned closure occurs when the project owner closes the facility suddenly and/or unexpectedly, or abandons the facility on a permanent basis. This includes unexpected closure where the owner remains accountable for implementing the on-site contingency plan. It can also include unexpected closure where the project owner is unable to implement the contingency plan, and the project is essentially abandoned. An on-site contingency plan that is in place and approved by the CPM prior to the beginning of commercial operation of the facilities will be developed to assure safety and reliability (see General Conditions Including Compliance Monitoring and Closure Plan).

CONCLUSIONS AND RECOMMENDATIONS

CONCLUSIONS

1. Staff's findings indicate that no significant additional new facilities will be required for interconnection of the MEC project to meet NERC, WSCC, and Cal-ISO reliability criteria.
2. The Cal-ISO will confirm staff's conclusion upon issuance of the final interconnection approval.
3. The power plant switchyard, outlet lines, and termination are acceptable and will comply with LORS assuming the conditions of certification are implemented.
4. The Cal-ISO will provide testimony on the Attachment A studies, the Supplemental Studies and the Detailed Facilities Study Report for the Energy Commission's hearings.
5. The issuance of the Cal-ISO's final interconnection approval will assure conformance with NERC, WSCC and Cal-ISO reliability criteria. A condition of certification TSE-1h provides for Energy Commission review of the Cal-ISO final interconnection approval letter and the PG&E/applicant Facility Interconnection Agreement.

RECOMMENDATIONS

Staff proposes the following conditions of certification to insure system reliability and conformance with LORS.

CONDITIONS OF CERTIFICATION

TSE-1 The project owner shall ensure that the design, construction and operation of the proposed transmission facilities will conform to requirements listed below. The substitution of Compliance Project Manager (CPM) approved "equivalent" equipment and equivalent switchyard configurations is acceptable.

- a) The power plant switchyard, outlet line and termination shall meet or exceed the electrical, mechanical, civil and structural requirements of CPUC General Order 95, Title 8, CCR, section 2700 et seq., "High Voltage Electric Safety Orders", National Electric Code (NEC), and Industry Standards.

- b) Breakers and busses in the power plant switchyard and other switchyards, where applicable, shall be sized to comply with a short-circuit analysis.
- c) The MEC 230 kV switchyard shall include busses in a breaker and a half scheme.
- d) The new transmission line will be a 230 kV double circuit line overhead extending 240 feet from the take off towers located inside the MEC switchyard to the existing tower No.0/6 of the Metcalf to Monta Vista No. 4 line located in the existing PG&E corridor. The tower will be modified to accommodate the new circuits.
- e) Termination facilities at the interconnection shall comply with applicable Cal-ISO and PG&E interconnection standards (PG&E Interconnection Handbook and CPUC Rule 21).
- f) Outlet line crossings and line parallels with transmission and distribution facilities shall be coordinated with the transmission line owner and comply with the owner's standards.
- g) The transmission interconnection will use bundled 2300 kcmil AAC conductors.
- h) The applicant shall provide a Detailed Facilities Study including a description of remedial action scheme sequencing and timing and an executed Generator Special Facilities Agreement (GSFA) for the transmission interconnection with PG&E. The Detailed Facilities Study and GSFA shall be coordinated with the Cal-ISO.

Verification: At least 60 days prior to start of construction of transmission facilities, the project owner shall submit for approval to the CPM:

- a) Design drawings, specifications and calculations conforming with CPUC General Order 95 and related industry standards, where applicable, for the poles/towers, foundations, anchor bolts, conductors, grounding systems and major switchyard equipment.
- b) For each element of the transmission facilities as identified above, the submittal package to the CPM shall contain the design criteria, a discussion of the calculation method(s), a sample calculation based on "worst case conditions" and a statement by the registered engineer in responsible charge (signed and sealed) that the transmission element(s) will conform with CPUC General Order 95, Title 8, CCR, section 2700 et seq, the NEC, PG&E Interconnection Handbook, CPUC Rule 21 and related industry standards.

- c) Electrical one-line diagrams signed and sealed by the registered professional electrical engineer in responsible charge, a route map, and an engineering description of equipment and the configurations covered by requirements a through h above. The Detailed Facilities Study and GSFA shall concurrently be provided. Substitution of equipment and substation configurations shall be identified and justified by the project owner for CPM approval.

TSE-2 The project owner shall inform the CPM of any impending changes, which may not conform to the requirements 1a through 1h of TSE-1, and have not received CPM approval, and request approval to implement such changes. A detailed description of the proposed change and complete engineering, environmental, and economic rationale for the change shall accompany the request. Construction involving changed equipment, transmission facilities or switchyard configurations shall not begin without prior written approval of the changes by the CPM.

Verification: At least 60 days prior to construction of transmission facilities, the project owner shall inform the CPM of any impending changes which may not conform to requirements of TSE-1 and request approval to implement such changes.

TSE-3 The project owner shall be responsible for the inspection of the transmission facilities during and after project construction and any subsequent CPM approved changes thereto, to ensure conformance with CPUC GO-95, the NEC, PG&E Interconnection Handbook, Cal-ISO tariffs and CPUC Rule No. 21 and these conditions. In case of non-conformance, the project owner shall inform the CPM in writing within 10 days of discovering such non-conformance and describe the corrective actions to be taken

Verification: Within 60 days after first synchronization of the project, the project owner shall transmit to the CPM:

- a) “As built” engineering description(s) and one-line drawings of the electrical portion of the facilities signed and sealed by the registered electrical engineer in responsible charge. A statement attesting to conformance with CPUC GO-95, the NEC, CPUC Rule No. 21, the PG&E Interconnection Handbook, and these conditions shall be concurrently provided.
- b) An “as built” engineering description of the mechanical, structural, and civil portion of the transmission facilities signed and sealed by the registered engineer in responsible charge.
- c) A summary of inspections of the completed transmission facilities, and identification of any nonconforming work and corrective actions taken, signed and sealed by the registered engineer in responsible charge.

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DEFINITION OF TERMS

AAC - all aluminum conductor.

Ampacity - current-carrying capacity, expressed in amperes, of a conductor at specified ambient conditions, at which damage to the conductor is nonexistent or deemed acceptable based on economic, safety, and reliability considerations.

Ampere - the unit of current flowing in a conductor.

Bundled - two wires, 18 inches apart.

Bus - conductors that serve as a common connection for two or more circuits.

Conductor - the part of the transmission line (the wire) which carries the current.

Congestion Management - congestion management is a scheduling protocol, which provides that dispatched generation and transmission loading (imports) will not violate criteria.

Emergency Overload - see Single Contingency. This is also called an L-1.

Kcmil or kcm - thousand circular mil. A unit of the conductor's cross sectional area, when divided by 1,273, the area in square inches is obtained.

Kilovolt (kV) - a unit of potential difference, or voltage, between two conductors of a circuit, or between a conductor and the ground.

Loop - an electrical cul de sac. A transmission configuration which interrupts an existing circuit, diverts it to another connection and returns it back to the interrupted circuit, thus forming a loop or cul de sac.

Megavar - one megavolt ampere reactive.

Megavarsm - mega-volt-Ampere-Reactive. One million Volt-Ampere-Reactive. Reactive power is generally associated with the reactive nature of motor loads that must be fed by generation units in the system.

Megavolt ampere (MVA) - a unit of apparent power, equals the product of the line voltage in kilovolts, current in amperes, the square root of 3, and divided by 1000.

Megawatt (MW) - a unit of power equivalent to 1,341 horsepower.

Normal Operation/ Normal Overload - when all customers receive the power they are entitled to without interruption and at steady voltage, and no element of the transmission system is loaded beyond its continuous rating.

N-1 Condition - see Single Contingency.

Outlet - Transmission facilities (circuit, transformer, circuit breaker, etc.) linking generation facilities to the main grid.

Power Factor - The power factor is the fraction of power generated that is delivered to resistive loads through the grid (real power), compared to the total power supplied (real power plus reactive power).

Power Flow Analysis - A power flow analysis is a forward looking computer simulation of essentially all generation and transmission system facilities that identifies overloaded circuits, transformers and other equipment and system voltage levels.

Reactive Power - Reactive power is generally associated with the reactive nature of motor loads that must be fed by generation units in the system. An adequate supply of reactive power is required to maintain voltage levels in the system.

Real Power - Real power is generally associated with the resistive nature of the load that must be fed by generation units in the system. Real power is required to serve resistive load in the system.

Remedial Action Scheme (RAS) – a remedial action scheme is an automatic control provision, which, for instance, will trip a selected generating unit upon a circuit overload.

SF₆ - sulfur hexafluoride is an insulating medium.

Single Contingency - also known as emergency or N-1 condition, occurs when one major transmission element (circuit, transformer, circuit breaker, etc.) or one generator is out of service.

Solid dielectric cable - copper or aluminum conductors that are insulated by solid polyethylene type insulation and covered by a metallic shield and outer polyethylene jacket.

Switchyard - a power plant switchyard (switchyard) is an integral part of a power plant and is used as an outlet for one or more electric generators.

Thermal rating - see ampacity.

TSE - transmission System Engineering.

Undercrossing - a transmission configuration where a transmission line crosses below the conductors of another transmission line, generally at 90 degrees.

Underbuild - a transmission or distribution configuration where a transmission or distribution circuit is attached to a transmission tower or pole below (under) the principle transmission line conductors.

LOCAL SYSTEM EFFECTS

Testimony of R. Peter Mackin, Al McCuen

INTRODUCTION

This joint testimony provides local system effects analysis and the conclusions of the California Energy Commission (CEC) staff and California Independent System Operator (Cal-ISO) staff (the authors). Local system effects include the performance characteristics of local generation, increase or decrease in system losses, deferral of capital investments, and operational reliability characteristics.

This testimony describes the local system effects of the Metcalf Energy Center (MEC) for consideration when evaluating project benefits and project impacts. The evaluation of local system effects is not required by Western Systems Coordinating Council (WSCC), North American Electric Reliability Council (NERC) or the Cal-ISO's Grid Planning Criteria but has been completed to provide a greater understanding of the electrical system in the South Bay Area. Conformance with reliability criteria is addressed in the Transmission System Engineering testimony and the System Reliability testimony of the Cal-ISO.

Connection of a generator to the system provides real and reactive power to the system and causes changes to current flow in transmission facilities such as transmission lines, transformers, circuit breakers and other equipment. The MEC, if approved and built, will provide about 600 megawatts of real power and 400 megavars of reactive power. The changes in current flow must not exceed the capability of the transmission facilities. Otherwise, steps must be taken to limit the current flow, or equipment with a higher rating must be installed. "Real power" in megawatts is used to supply lighting, motors, system losses, computers and numerous other appliances. Reactive power is necessary to accommodate principally motor loads. If reactive power is insufficient, system voltages will decrease, which could lead to the dropping of customers and cascading outages.

Generally, there are two ways to supply power to an area. Power may be produced and distributed locally or power may be produced remotely and shipped into the area on transmission facilities. The amount of power that can be supplied from remote location is limited by the capacity of the transmission lines serving the area. A system with robust reliability is generally characterized as one that has a combination of local generation and power imports to support local load and not significantly stress the backbone system.¹

In this analysis we evaluated the system in years 2002 and 2005 with and without the MEC. In this manner we were able to determine the effects of the project on system losses, system performance under outage conditions, reactive margin,

¹ The backbone system is the major 500 kV and most 230 kV lines within California and the power they import to California from other states. For example, the California Oregon Intertie and the Pacific Direct Current Intertie are rated respectively, at 4,800 megawatts and 3,100 megawatts. These lines can be used to import power from the Northwest to serve California loads.

operational reliability and deferral or redeployment of capital facilities. Through the modeling we determined that MEC will provide significant local system benefits for the South Bay Area (valued in the millions of dollars), resulting in increased reliability and significant energy savings.

LAWS, ORDINANCES, REGULATIONS AND STANDARDS (LORS)

There are no legally required LORS specifying the characteristics of a local system effects analysis. Where appropriate the authors have utilized WSCC, NERC, and Cal-ISO system reliability criteria regarding outages and system reactive margin criteria to assess the benefits or detriments of the MEC project. CEQA does however, provide guidance to decision-makers. To assure that energy implications are considered in project decisions CEQA requires that EIRs include a discussion of the potential energy impacts of proposed projects with particular emphasis on avoiding or reducing inefficient, wasteful, and unnecessary consumption of energy. CEQA also emphasizes that the decision-maker consider "The effects of the project on local and regional energy supplies and on requirements for additional capacity," (CEQA Appendix F).

SETTING AND AREA RESOURCES

AREA RESOURCES

The "South Bay Area" is composed of PG&E's De Anza and San Jose Divisions as shown on Figure 1 attached (Figure 1 is the Greater Bay Area definition from PG&E's 1999 five year Transmission Assessment study plan).

The De Anza Division is located in the South Bay and extends from Los Altos in the north to Los Gatos in the south. The De Anza Division is part of Santa Clara County and makes up the western portion of Silicon Valley. The major transmission feed to the area is the Monta Vista substation, which is connected to the 230 kV system. The peak electric demand in 1999 was approximately 830 MW. The 1999 demand forecast for a 1-in-10 year adverse weather condition in 2000 is approximately 890 MW. The 1999 demand forecast for a 1-in-10 year adverse weather condition in 2005 is 938 MW. The load is distributed among the major population centers: Saratoga, Mountain View, Los Altos and Los Gatos.

The San Jose Division is located in the South Bay Area and extends from Milpitas in the north to Gilroy in the south. The San Jose Division makes up most of Santa Clara County and Silicon Valley. The peak demand in the San Jose Division in 1999 was approximately 1,700 MW. The 1999 demand forecast for a 1-in-10 year adverse weather condition in 2000 is 1,850 MW. The demand forecast for a 1-in-10-year adverse weather condition in 2005 is 2,060 MW. The load is distributed among the major population centers: San Jose, Milpitas, and Morgan Hill. The Metcalf substation provides the major feed to the area.

Power is supplied to the South Bay Area by generation located in the area and major transmission lines shipping power into the area. The total local generation in

both the year 2002 and the year 2005 is 242 MW. The modeled load in the area is 2,857 MW in 2002 and 3,297 MW in 2005 during peak conditions resulting in 2,615 MW and 3,051 MW respectively shipped into the area from distant substations.

Power to the northern portion of the South Bay Area (Newark and Los Esteros substations) is provided primarily from Tesla and Metcalf (see Figure 2). Power also flows from the Newark and Tesla substations to Ravenswood and thence to San Mateo serving a little over one third of the Peninsula and San Francisco load. Approximately another third of the power to the Peninsula and San Francisco areas (San Mateo substation) comes from Contra Costa, with the remaining Peninsula and San Francisco area load served by local San Francisco generation². Because there is virtually no local generation in the area, except at the area's outskirts, large capacitors located at the Metcalf substation, Monta Vista substation, Newark substation and Trimble substation are used to maintain voltages in the area. Numerous small capacitors are also used in the distribution system to maintain voltages. Capacitors are needed in areas devoid of generation because sufficient reactive power to serve motor loads can not be transmitted on long transmission circuits. While it is possible to operate a system devoid of local generation reliably using capacitors to maintain voltages, there are serious operational difficulties in such a system because capacitors are a discrete size and can only be applied to the system in steps. When these discrete capacitor steps are switched into the system, they can cause rapid current and voltage changes to occur. These rapid current and voltage fluctuations can have detrimental effects on sensitive manufacturing and data processing loads. Generating units such as MEC on the other hand, provide continuous reactive support responding smoothly to the system's need to maintain voltages and are the preferred alternative from the perspective of power quality.

FIVE YEAR TRANSMISSION ASSESSMENT

In 1999, in accordance with the California ISO Tariff and the California ISO Grid Coordinated Planning Process, PG&E prepared a transmission expansion plan covering a five-year planning horizon for its service territory³.

The purpose of PG&E's transmission expansion plan is to:

- Evaluate the performance of the portion of the California ISO Grid owned by PG&E using reliability criteria established by the California ISO.
- Identify areas where transmission facilities are projected to be inadequate in meeting the California ISO reliability criteria.
- Identify transmission upgrades needed to ensure that the PG&E transmission system is adequate to conform to the California ISO Grid Planning Criteria.

² The distribution of flows is a function of the transmission network, load distribution, and generation pattern. The distribution described above is for summer peak conditions with all Bay Area generation running at maximum output.

³ PG&E is currently in the process of developing its 2000 transmission expansion plan. Because the 2000 transmission assessment is not complete and the projects needed to meet the ISO Grid Planning Criteria based on this assessment have not yet been defined, this testimony describes the latest complete transmission plan for the greater San Francisco Bay Area.

PG&E's 1999 transmission assessment indicates that due to forecasted load growth, the PG&E transmission system will experience California ISO reliability criteria violations in the next five years without transmission upgrades. The problems identified in the assessment include primarily normal and emergency overloads of the transmission facilities. In addition, low voltage concerns or excessive voltage deviations were identified in some areas. To address the problems identified in the studies, PG&E evaluated measures such as transmission system upgrades, increasing equipment ratings, or implementing new operating procedures such as planned involuntary load interruptions. A specific description of each of PG&E's proposed projects in the Bay Area is given in the Appendix A (Due to the size of the appendices, they have been docketed under separate cover). The total cost of the projects in PG&E's 1999 transmission expansion plan is over \$254 million.

It should be noted that PG&E's 1999-transmission assessment is based on very low forecasts of Bay Area load growth. The current system benefits analysis that we have undertaken here is based on the latest and most accurate transmission planning load forecast. In addition, the latest approved Bay Area transmission reinforcements are incorporated into the base cases.

FUTURE GENERATION RESOURCES

There is some 10,900 MW of generating stations requesting approval before the Energy Commission. It is anticipated that such power increases, if approved by the Commission, would provide sufficient power for the state's overall needs. However, the provision of power at, for instance, the Midway substation (some 2000 MW) or the provision of power at Moss Landing Power Plant or Pittsburg District Energy Facility, Three Mountain Power Project or Delta Energy Center does not mean the power would be available locally. As stated previously, power must either be shipped into the area on long and presently stressed transmission lines or produced locally. In the South Bay Area, significant upgrades of the transmission infrastructure is required if power is not sited locally. This infrastructure would include many miles of linear facilities with corresponding environmental impacts that would not occur or at least would be deferred to some later date if the MEC is built.

The Cal-ISO has also recently initiated a process to secure future temporary generation resources. On August 28, 2000 the Cal-ISO issued a Request for Bids (RFB) for up to 3,000 MW of temporary peaking generating capacity for the summer of 2001. The RFB specifically requests bids for one year. However, two and three year bids will be considered if the responses for one year arrangements are insufficient. Any generation accepted through this RFB will likely have restricted operating characteristics (i.e., approximately 500 hours of operation between June 1 - October 31). The authors have determined that this potential generation should not be included in our analysis of system performance due to its short-term nature and restricted operating characteristics. Therefore, we have not included any amount of potential winning capacity from this Cal-ISO RFB in our analysis.

ANALYSIS

This analysis is based on year 2002 and year 2005 modified power flow cases. The specifics of these modifications are described in Appendix B (docketed under separate cover). The original cases used to develop the special study cases to evaluate local system effects were the 2002 heavy summer⁴ power flow case originally used by PG&E, Cal-ISO, Applicant and staff to evaluate MEC's impact on the system's conformance with reliability criteria, and a 2005 heavy summer case developed by PG&E as part of their 2000 Transmission Expansion Plan. The specific changes to these cases are described in detail in Appendix B. Modelling changes to market generation for study year 2002 were: Delta Energy Center output increased from 0 MW to 880 MW, and Los Medanos Energy Center added at 580 MW. Modelling changes to market generation for study year 2005 were: Delta Energy Center output increased from 0 MW to 880 MW, Los Medanos Energy Center output increased from 380 MW to 580 MW, and Moss Landing Power Plant Project added at 1,100 MW. We also included re-rates⁵ of equipment, added PG&E transmission system projects recently approved by the Cal-ISO outside of the annual transmission expansion planning cycle, and modified generation output of various units. Following are the transmission projects that were added to the system modeling for our analysis:

- Reconductor Pittsburg-Tassajara 230 kV line.
- Split Metcalf-Monte Vista 230 kV line into 2 circuits.
- New (3rd) Tesla 500 kV transformer.
- New Newark-Tesla 230 kV line.
- Loop Newark-San Mateo 230 kV line into Ravenswood.
- Add 350 MVAR static capacitors to Metcalf 500 kV bus.
- Add 100 MVAR static capacitors to Martin 115 kV bus.

Finally, we modified forecast loads for the Greater Bay Area given that they have substantially increased above the levels used in earlier PG&E transmission analysis performed for this project. The Bay Area loads were scaled up to a forecast peak demand of approximately 10,000 MW in 2002 and 10,750 MW in 2005. The load scaling applied to achieve the targeted 10,000 MW in 2002 and 10,750 MW in 2005 was based on the recent recorded loads for the Greater Bay Area. Recorded peak load indicates higher loads and growth rate than the load forecasts used for the 1998 and 2000 PG&E Transmission Assessment studies. Starting from a 9,000 MW load value for the Greater Bay Area in year 2000, the annual increase in load assumed for our study was approximately 500 MW per year through 2002, and 250 MW per year from 2003 to 2005.

⁴ Heavy summer means hot summer when loads are very high (heavy).

⁵ A re-rate of a transmission facility occurs when engineers assign a new rating. For instance a transformer may have an initial rating of 100 MW and be re-rated to 110 MW based on special studies which evaluate the ability of the transformer to carry the additional load without a significant increase in loss of life.

CRITERIA

The following criteria have been developed to assess the performance characteristics of local generation⁶:

- **Increase or decrease in system losses.** The increase or decrease is identified by comparing the system without the target generator and with the target generator interconnected and operating.
- **Impact to system performance under outage conditions.** Comparison of system outage performance is determined by measuring 1) transmission facility loading under outage conditions with and without the target generator and 2) change in voltage levels under outage conditions with and without the target generator.
- **Reactive margin.** Reactive margin is determined by power flow analysis to identify the relative change in reactive margin due to the addition of the target generator.
- **Operational reliability.** Operational reliability includes an evaluation of RMR costs and an evaluation of whether or not the new facility would provide increased or decreased operational flexibility.
- **Ability to be integrated into existing and planned system.** This criterion is determined by evaluation of the need for major system additions or system modifications to accommodate the new facility.
- **Deferral of capital facilities and redeployment of existing facilities.** Deferral of capital facilities is determined by identifying proposed facilities for which need is delayed or eliminated because a target generator off-sets the need for such facilities. Redeployment of existing capital facilities occurs when a target generator removes the need for an existing facility and this facility can be utilized in a different location.

SYSTEM LOSS ANALYSIS

Transmission system losses are a function of generation schedules, imports, exports, wheeling and system loop flow in addition to load. Transmission line losses occur as a result of conductor resistance and corona discharge. Resistance line losses are significant, especially on long heavily loaded lines with a high load factor (75% - 100%). Typical values for utility systems in California range from 12 kW/mile to 500 kW/mile for line loadings between 25% and 100% of the conductor ratings.

Resistance line losses are generally described as I^2R heating dissipation losses. These losses are similar to the operation of electric strip heaters for home and building use where heat is produced by connecting a resistor heating element across 120v or 240v, and allowing the current to flow through the resistor element.

⁶ The development of these criteria was based on the professional knowledge of the authors and comments by the applicant, Intervenor and public in the MEC siting process. These criteria are strictly based on electrical system and resource performance and excludes environmental or other non-engineering considerations which are beyond the expertise of the authors.

Based on the predicted 2002 and 2005 PG&E system peak demand of 24,416 MW and 26,693 MW, the primary system losses (transmission lines and transformers) are approximately 1,005 MW and 1,125 MW respectively without the MEC operating. Transmission losses thus constitute 4% of the load.

Transmission line losses were assessed for 7 dispatch scenarios in 2002 and 8 scenarios for 2005. These dispatch scenarios were selected to bracket the range of dispatch conditions that occur in an actual year. Because the power supplied to the system must equal the system load plus the losses, when the MEC operates, 600 MW of generation as shown by the dispatch scenarios must be reduced to balance the additional 600 MW from MEC. The baseline for comparison was the system losses without the MEC. Losses with MEC on line and other units redispatched according to the established dispatch scenarios were then compared to the baseline.

As indicated in Table 1, for the year 2002, Dispatch 1 through 6 present the line losses after adding the Metcalf generation and reduced 600 MW generation at the Pittsburg Power Plant, Moss Landing Power Plant, a combination of Sunset and Diablo Power Plants, the Hyatt Power Plant, and a combination of the Sunset and Hyatt Power Plants. For Dispatch 7, a total of 500 MW was reduced from the California Oregon Intertie (COI).

By adding MEC and reducing generation as depicted in Dispatch Scenarios 1-6, the overall average reduction in system losses is 36 MW. With local generation reduced, the system average reduction in losses is 18 MW and with remote generation reduced, the average reduction in system losses is 44 MW for the year of 2002 (See Table 1 and Table 2).

As indicated in Table 2 for the year 2005, Dispatch 1 through 7 present the line losses after adding the Metcalf generation and reduced generation of 600 MW at the Pittsburg Power Plant, the Moss Landing Power Point, a combination of Sunset Power Plant and Diablo Power Plant, the La Paloma Generating Project, the Hyatt Power Plant, and a combination of the Sunset and Hyatt Power Plants. For Dispatch 8, a total of 500 MW was reduced from the COI.

The overall average reduction in system losses is 48 MW for the year 2005. The average reduction in system losses for local adjustment is 25 MW and for remote adjustment is 58 MW. Load flow solution summaries listing total system losses for each dispatch are provided in Appendix C1 (2002), and C2 (2005) (docketed under separate cover).

For both years studied, the reduction in system losses with MEC on line is very substantial. For year 2002, the loss reductions show that production of 600 MW at MEC is equivalent⁷ to actually providing 612 to 667 MW from other resources. The

⁷ A loss reduction factor is one way to understand the significance of loss reductions. For the QF industry, loss factors of 0.95 to 1.05 were shown to occur for generating units connected to the system. A loss factor of 1.05 means that with 100 MW operating, there is an effective power

additional 12 to 67 MW is “produced” without the use of any additional fuel or water and without producing any additional plant emissions. From a system average perspective, operating the MEC at 600 MW would be equivalent to having an extra 36 MW of generation with no additional use of fuel or water and with no additional environmental impacts.

For year 2005, the reduction in system losses from the operation of MEC is equivalent to producing 21 to 84 MW without any additional fuel or water and without any additional emissions. The average system loss reduction is equivalent to having an extra 48 MW with no additional emissions and with no additional fuel or water use. Loss reductions of 6 to 10 MW are considered to be significant, while loss reductions of 12 to 67 MW or 21 to 84 MW have substantial benefits as illustrated by the magnitude of the related energy and cost savings discussed below.

To estimate the annual energy savings we assigned probabilities to the various dispatch scenarios tested. Multiplying the unique dispatch related loss values by the assigned dispatch probability provided an expected overall MW loss value for each study year: 30 MW in 2002 and 39 MW in 2005. The estimated annual energy savings that correspond to the expected overall system loss reduction values noted above are 64 GWh in study year 2002 and 81 GWh in study year 2005. These amounts of energy savings are equivalent to the annual energy requirement for 9,000 and 12,000 homes respectively. The value of the associated energy for study year of 2002 was estimated to be \$3 to \$4 million per year. Over a twenty-year period, the present value of this energy would be \$23 to \$34 million. In calculating these values for the loss savings, the following assumptions were made:

- natural gas prices are \$4 - \$5/MMBtu,
- the displaced unit's heat rate is 12,000 – 13,000 Btu/kWh,
- any emissions offsets created were valued at \$0 (a very conservative assumption), and
- the rate of return is 12%.

The calculations for this analysis are contained in Appendix G1 for study year 2002. Appendix G2 contains the comparable calculations for study year 2005 (docketed under separate cover).

There are also important positive environmental implications to such a substantial reduction of lost energy. To assure that energy implications are considered in project decisions, CEQA requires that EIRs include a discussion of the potential energy impacts of proposed projects with particular emphasis on avoiding or reducing inefficient, wasteful and unnecessary consumption of energy and the project's effect on local and regional energy supplies. Most decision-makers generally are faced with only the negative energy use considerations when approving a project that may result in significant increased use of energy. This

increase of 105 MW. These same criteria applied to the MEC results in a loss factor of 1.07 based on 2002 average system loss reduction and 1.08 for 2005.

Commission faces a different situation in that the MEC will substantially reduce energy losses and provide numerous benefits to the local and regional energy supply. If one anticipates that the MEC, if built, would operate for at least 20 years, there are substantial long-term environmental benefits related to reduced fuel and water use and to reduced emissions.

TABLE 1
MEC ANALYSIS - Year 2002
TOTAL PG&E System Losses / System Loss Reduction

	PRE-PROJECT (MW)	WITH MEC (MW)	SYSTEM LOSS REDUCTION (MW)	EXPECTED PEAK LOSSES* (MW)	EXPECTED ENERGY SAVED* (GWh)
Base Dispatch, Local Adjustment, Swing Gen = Vincent	1005				
Dispatch 1: Local Adjustment MEC = +600 MW, Ptsb=-600		980	25	8	22
Dispatch 2: Local Adjustment MEC = +600 MW, Moss Landing = -600		993	12	2	7
Dispatch 3: Remote Adjustment MEC = +600, Sunset =-210, Diablo -390		987	18	2	3
Dispatch 4: Remote Adjustment MEC = +600 MW, Hyatt = -600		954	51	5	8
Dispatch 5: Combo Adjustment MEC = +600, Pittsburg = -300, Hyatt = -300		966	39	6	13
Dispatch 6: Remote Adjustment, MEC = +600, Sunset = -230, Hyatt = -300		964	41	4	6
Dispatch 7: Remote Adjustment, MEC = +600, COI = -500		938	67	3	5
Totals:				30	64
Average:			36		--

* Calculation of the expected MW and related expected energy savings is illustrated in appendix G-1.

TABLE 2
MEC ANALYSIS - Year 2005
TOTAL PG&E System Losses / System Loss Reduction

	PRE-PROJECT (MW)	WITH MEC (MW)	SYSTEM LOSS REDUCTION (MW)	EXPECTED PEAK LOSSES* (MW)	EXPECTED ENERGY SAVED* (GWh)
Base Dispatch, PG&E Assesment 2005, Swing=Vincent.	1125				
Dispatch 1: Local Adjustment MEC = +600, Pittsburg = -660		1104	21	7	19
Dispatch 2: Local Adjustment MEC = +600, Moss Landing = -600		1096	29	6	17
Dispatch 3: Remote Adjustment MEC = +600, Sunset = -210, Diablo = -390		1085	40	2	3
Dispatch 4: Remote Adjustment MEC = +600, La Paloma = -600		1084	41	4	6
Dispatch 5: Remote Adjustment MEC = +600, Hyatt = -600		1061	64	3	5
Dispatch 6: Combo Adjustment MEC = +600, Pittsburg = -300, Hyatt = -300		1078	47	7	16
Dispatch 7: Remote Adjustment MEC = +600, Sunset=-210, Hyatt=-390		1066	59	6	9
Dispatch 8: Remote Adjustment MEC = +600 , COI = -500		1041	84	4	6
Totals:				39	81
Average:			48		--

* Calculation of the expected MW and related expected energy savings is illustrated in appendix G-2.

COMPARISON OF SYSTEM OUTAGE PERFORMANCE

Transmission system performance under “outage”, or “emergency” conditions was analyzed using transmission load flow modeling. Two aspects of modeled system performance analyzed were 1) transmission facility loading, and 2) substation bus voltage level. Following are the performance criteria used to compare relative system performance between load flow cases run with, and without, the MEC project operating at 600 MW.

- 1) Transmission line and transformer loadings which,
 - A) deviate more than 5% between ‘with’ and ‘without’ MEC load flow cases; and,
 - B) exceed component emergency (post-outage) rating⁸ in at least one of the scenarios (i.e., the before MEC case, the after MEC case, or in both cases).
- 2) Substation bus voltages which,
 - A) deviate more than 2% between ‘with’ and ‘without’ MEC load flow cases, and,
 - B) are below 90% of nominal voltage level (500, 230, 115, or 69kV) in at least one of the scenarios (i.e., the before MEC case, the after MEC case, or in both cases).**

Each set of ‘with’ and ‘without’ MEC scenarios were run for the following study years and load forecasts: Year 2002 Peak, Year 2002 Off-Peak, and Year 2005 Peak. Each operating scenario was tested for a set of transmission outage contingencies used by PG&E and CAL-ISO for Greater Bay Area planning assessment work performed this year. The complete list of the 204 N-1 and N-2 outages used in this study is provided in Appendix D-1 and D-2 (docketed under separate cover). Table 3 below tabulates the impact on the number of overloads due to the addition of MEC. And Table 4 tabulates the impact on number of low bus voltage conditions due to the addition of MEC. Supporting detailed information giving specific impacted facilities, the related outages, and severity of criteria deviations are provided in Appendix E (docketed under separate cover).

Table 3

LOAD FLOW SCENARIO	Number of Overloads Eliminated w/ MEC	Number of Overloads Improved w/ MEC	Number of Overloads Introduced w/ MEC	Number of Overloads Worsened w/ MEC
Year 2002, Peak	6	14	0	4
Year 2002, Off Peak	2	0	0	0
Year 2005, Peak	10	29	2	7

⁸ These criteria are consistent with, but not as detailed as, typical industry system planning criteria.

Table 4

LOAD FLOW SCENARIO	Number of Low Voltages Eliminated w/ MEC	Number of Low Voltages Improved w/ MEC	Number of Low Voltages Introduced w/ MEC	Number of Low Voltages Worsened w/ MEC
Year 2002, Peak	7	0	0	0
Year 2002, Off Peak	0	0	0	0
Year 2005, Peak	108	36	0	0

An additional load flow result was used to compare relative system performance; the number of outage contingencies for which the load flows model could not calculate a solution. Cases in which the load flow's iterative numerical calculations do not converge on a solution but rather diverge away from a stable numerical solution can be assumed to indicate high system stresses. Divergent cases are generally used as a way to screen for outage conditions which may be related to potential voltage collapse. Comparison of the number of divergent cases between 'with' MEC and 'without' MEC scenarios is given below in Table 5.

Table 5

LOAD FLOW SCENARIO	Number of Divergent Cases without MEC	Number of Divergent Cases with MEC
Year 2002, Peak	0	0
Year 2002, Off Peak	0	0
Year 2005, Peak	35	14

As illustrated in Tables 3, 4, and 5 above, MEC improves modeled future transmission system performance as measured by: 1) reduction in number of component overloads; 2) reduction in number of low bus voltages; and 3) reduction in number of outage cases which the load flow model could not solve.

REACTIVE MARGIN

Reactive power must be available at important buses to prevent voltage collapse. Reactive margin is the amount of additional reactive load, usually measured in MVAR's, which may be added at a particular bus before the system is under threat of voltage collapse. Power flow analysis was used in our analysis to estimate the relative change in reactive margin due to the addition of MEC at four Greater Bay Area substation transmission busses: Metcalf 500 kV, Metcalf 230 kV, Newark 230 kV, and Tesla 500 kV.

The "Q/V curve" method of measuring reactive margin at a particular bus was used in our analysis and follows these general steps:

- Identify loadflow contingency cases which ‘diverge’, or which create the lowest resulting bus voltages. These are candidate conditions for testing reactive margin at the busses of interest.
- Solve the load flow case for the identified contingencies.
- For each case re-run the load flow iteratively with a fictional synchronous condenser at the bus being analyzed. All other switching components in the load flow case such as tap changing transformers or switched reactive devices are held constant for these runs so the existing generators and the fictional condenser are the only changing sources and sinks of reactive power.
- Each iteration is run with an incremental change to scheduled bus voltage.
- For each of these iterative cases, the amount of reactive VARS absorbed or provided by the synchronous condenser is recorded.
- The iterative runs are repeated until the point at which the slope (dV/dQ) of the Q/V curves transitions from positive to negative. This point is referred to as the ‘nose-point’ of the Q/V curve. This is the point of voltage instability, or collapse.

When a Q/V analysis is run for identification of the absolute reactive margin level at a bus, loads are scaled-up typically by 5 percent. In this case, we are interested in the relative movement of the nose point between cases with and without MEC. Therefore, we did not scale the loadflow loads as part of our Reactive Margin study.

In our analysis, two contingency cases were used for testing MEC’s impact to the reactive margin at the monitored busses noted earlier. The two contingencies were:

- 1) N-2 of Tesla-Metcalf 500 kV line and Pittsburg Unit 7 generator,
- 2) N-2 of Pittsburg-San Ramon and Pittsburg-Tassajara 230 kV transmission lines.

The results indicating the relative movement of the reactive margin nose-point with addition of the MEC project is summarized below in **Table 6** and **Table 7**.

Appendix F1 and F2 contain the related ‘Q’ and ‘V’ results of each iterative run for all scenarios listed in **Tables 6 and 7**.

Table 6

Contingency Case = N-2, Tesla-Metcalf 500kV+Pittsburg Unit 7

Load Flow Scenario	'Nose-Point' without MEC	'Nose-Point' with MEC	+/- Change in Bus Reactive Margin
Monitored Bus			
Year 2002 Peak			
Metcalf 500 kV	-510 MVar	-859 MVar	+349 MVar
Metcalf 230 kV	-472 MVar	-791 MVar	+319 MVar
Tesla 500 kV	-901 MVar	-1349 MVar	+448 MVar
Newark 230kV	-573 MVar	-903 MVar	+330 MVar
Year 2005 Peak			
Metcalf 500 kV	No sol'tn	-724 MVar	Undetermined ⁹
Metcalf 230 kV	-64 MVar	-618 MVar	+554 MVar
Tesla 500 kV	No sol'tn	No sol'tn	Undetermined
Newark 230 kV	-61 MVar	-528 MVar	+467 MVar

Table 7

Contingency Case = N-2, Pittsburg-San Ramon+Pittsburg-Tassajara 230 kV

Load Flow Scenario	'Nose-Point' without MEC	'Nose-Point' with MEC	+/- Change in Bus Reactive Margin
Monitored Bus			
Year 2002 Peak			
Metcalf 500 kV	789 MVar	-1038 MVar	+249 MVar
Metcalf 230 kV	644 MVar	846 MVar	+202 MVar
Tesla 500 kV	1002 MVar	1275 MVar	+273 MVar
Newark 230 kV	-650 MVar	-811 MVar	+161 MVar
Year 2005 Peak			
Metcalf 500 kV	No sol'tn	No sol'tn	Undetermined
Metcalf 230 kV	-35 MVAR	- 535 MVAR	+500 MVAR
Tesla 500 kV	No sol'tn	No sol'tn	Undetermined
Newark 230 kV	No sol'tn	-381 MVar	Undetermined

As illustrated in **Tables 6 and 7** above, MEC improves modeled future transmission system performance as measured by relative positive change in reactive margin at several tested major transmission substation busses which serve the Greater Bay

⁹ Although the relative change is undetermined, it can be stated qualitatively that MEC improves reactive margin for cases that the loadflow solutions solved with inclusion of MEC.

Area part of PG&E's transmission system. The benefit that this improved system performance provides is potentially reduced capital expenditures for dynamic reactive devices¹⁰ in the South Bay area to meet the reactive requirements for the studied contingencies. Because we looked at reactive margin changes for only two (out of over 200 possible major Bay Area contingencies), quantifying these benefits is not feasible.

OPERATIONAL RELIABILITY

DECREASED RELIABILITY MUST RUN (RMR) COSTS

The addition of the MEC to the ISO controlled grid has the potential to reduce RMR costs.

The ISO is currently undertaking a project for Comprehensive Market Reform (CMR). As part of this project, the ISO is looking at new ways to procure the local area reliability services that it currently procures via RMR contracts. If the ISO proceeds with its proposal for procurement of reliability service via two day ahead local reliability services auctions, then the addition of more generation in the Bay Area should reduce the cost of procuring these services since there would be additional generation during off-peak and partial peak times to provide competition for the existing generation sources. This additional competition should serve to provide an overall decrease in the cost of providing local reliability services.

If the ISO were to maintain its current practice of executing RMR contracts with generators in the local areas with both market power problems and reliability concerns, then again, the additional generation at MEC should result in reduced costs. Even though all units in the Bay Area are likely to be needed for RMR¹¹, the total cost of RMR would most likely be reduced by the presence of the MEC. The reason RMR cost would be lower is that for each hour of the year, the RMR units are dispatched at the minimum levels required to meet the ISO reliability criteria. Since more efficient units (such as MEC) can be dispatched instead of less efficient existing units during off-peak and partial-peak conditions, the costs incurred under the RMR contracts for maintaining local system reliability should be less than if these new units were unavailable.

ADDITIONAL OPERATIONAL FLEXIBILITY

The addition of the Metcalf Energy Center to the Greater Bay Area grid will provide additional operational flexibility for operators of the ISO controlled grid. For example, under partial load conditions, the additional generation provided by the MEC will provide additional flexibility for the ISO, PG&E, and generation owners in the Bay Area when it comes to scheduling maintenance of transmission facilities and generating units. This additional flexibility will add badly needed margin to the

¹⁰ Examples of dynamic reactive devices are synchronous condensers and Static Compensators or StatComs.

¹¹ The competitive solicitation for Local Area Reliability Services for 2002 or 2005 has not yet occurred, so it is not possible to state with certainty which units would be designated RMR at this time.

system to help prevent problems from occurring when unexpected high temperatures combine with unforeseen extended maintenance outages to adversely impact the operation of the grid (such as occurred on June 14, 2000).

ABILITY TO BE INTEGRATED INTO EXISTING AND PLANNED SYSTEM

Based on the Detailed Facilities Study from PG&E, the Metcalf Energy Center can be connected to the ISO controlled grid with no major additions to the ISO controlled grid. There is no evidence that any of the additional facilities planned to be added to the ISO controlled grid through 2005 will need to be modified because of the addition of the MEC (other than the potential project deferrals discussed in the next section).

DEFERRAL OF CAPITAL FACILITIES AND REDEPLOYMENT OF EXISTING FACILITIES

To have beneficial impact, i.e. enable deferral or redeployment, of grid capital facilities, the MEC project must: 1) reduce a criteria violation which triggered a project; and 2) be in service prior to the required on line date of the capital project. The following grid projects, identified through joint PG&E and Cal-ISO capital facility planning processes, as well as this analysis, are potential deferral candidates due to the impact of MEC:

1. the 3rd Metcalf 500/230 kV transformer,
2. the Contra Costa - Eastshore 230 kV line reinforcement (37 miles line),
3. the Newark - Ravenswood 230 kV line reinforcement (8 mile line),
4. the Castro Valley - Newark 230 kV line reinforcement (25 mile line),
5. the Tassajara - TES Junction 230 kV line reinforcement (3 ½ mile line), and,
6. voltage support to mitigate low voltages at 107 substations.

Studies performed by the authors as part of this analysis indicate that the 3rd Metcalf 500/230 kV transformer can be deferred for four years if the MEC is present. The four 230 kV line reinforcement projects will be deferred at least one year. Due to the screening nature of this analysis, it is not possible to more definitively determine the actual deferral of these four projects. However, the analysis shows that overloads of the first three of these lines (deferral candidates 2-4) that are projected to occur in year 2005, are reduced below 98% of the facilities normal rating.

Deferral candidates 4 and 5 were identified as facilities overloaded by the connection of the Delta Energy Center to the ISO Controlled Grid. Even though the cost savings from these two projects may not flow back directly to PG&E ratepayers, the environmental benefits of not constructing or of deferring these reinforcements will still be created if the MEC is present.

The 2005 analysis indicated that 107 more substations would be in violation of ISO Grid Planning voltage criteria if the MEC were not present. While it is beyond the scope of this analysis to determine the quantity and location of the voltage support

to mitigate these voltage problems, the amount of voltage support required is likely to be significant.

The determination of MEC's ability to defer or allow redeployment of the noted grid projects will require detailed analysis by PG&E and review by the Cal-ISO. When appropriate, this analysis will take place via a Cal-ISO planning process (such as the annual joint Cal-ISO/Transmission Owner Transmission Expansion Planning process). Before this analysis can occur, the MEC must meet the requirements for inclusion in any Cal-ISO/PG&E grid planning process. For the PG&E 2000 Annual Transmission Expansion Planning study, these requirements are: ISO approval of PG&E's Detailed Facilities Study and initiation of the CEC AFC process.

Pending full analysis of MEC's impact on proposed grid projects via analysis of the project in a detailed grid planning assessment, our conclusion is limited to the identification of MEC's potential for deferral or redeployment of the projects noted above.

CONCLUSIONS

- California and the greater San Jose area face potentially serious electricity shortages which necessitates immediate action by the state.
- The siting of local generation such as MEC is of statewide importance to assist in maintaining an adequate supply of electric power.
- The addition of the MEC project significantly reduces system losses that would otherwise result from transporting power in the transmission system. The estimated energy savings from the reduced system losses would provide sufficient energy to serve 9,000 to 12,000 homes each year. In 2005, 39 MW and 81 GWh valued between \$23 - \$34 million would be realized. This would also contribute to a related decrease in the use of fossil fuels, water, and production of air emissions.
- The MEC project provides a significant source of real and reactive power to serve loads in the South Bay Area, which substantially reduces the need for imported power over stressed transmission facilities and local reactive facilities to prevent voltage collapse.
- The MEC would provide an increase in reactive margin of hundreds of megavars. This increases the South Bay area's ability to maintain voltages and prevent voltage collapse as well as assist in the maintenance of interconnected system reliability.
- The MEC can be interconnected to the transmission system with no negative reliability implications.
- Reliability Must Run (RMR) costs will likely be reduced and the MEC provides additional operational flexibility especially during medium to high load conditions when some Bay Area resources may be on scheduled maintenance.

- The MEC may result in deferral or relocation of substantial capital facilities planned or currently located in the South Bay Area and Greater Bay Areas. These capital facilities involve tens of millions of ratepayer dollars. In addition, the deferral or the elimination of linear facilities can result in deferral or elimination of the environmental impacts associated with tens of miles of such construction.
- There are no other power plant generation proposals in the South Bay Area that will provide similar local system reliability benefits. Even if such plants are proposed in the future, and assuming that they are licensed and built, they cannot provide these benefits in the same near time frame that the MEC will provide them.

REFERENCES

- Cal-ISO (California Independent System Operator). 2000. Cal-ISO letter from Terry Winter to Commissioners Laurie and Keese, September 1, 2000.
- Pacific Gas and Electric (PG&E). 1999. 1999 Electric Transmission Facility Plan, December 15, 1999.

DEFINITION OF TERMS

AAC	All Aluminum conductor.
ADR	Alternative Dispute Resolution
ANCILLARY SERVICES MARKET	The market for services other than scheduled energy that are required to maintain system reliability and meet WSCC/NERC operating criteria. Such services include spinning, non-spinning, replacement reserves, regulation (AGC), voltage control and black start capability.
AMPACITY	Current-carrying capacity, expressed in amperes, of a conductor at specified ambient conditions, at which damage to the conductor is nonexistent or deemed acceptable based on economic, safety, and reliability considerations.
AMPERE	The unit of measure of electric current; specifically, a measure of the rate of flow of electrons past a given point in an electric conductor such as a power line.
AVAILABLE TRANSMISSION CAPACITY (I.E., ATC)	Available Transmission Capacity in any hour is equal to Operational Transmission Capacity for that hour minus Existing Transmission Contracts for that same hour ($ATC = OTC - ETC$). (See the other definitions below).
Breaker	Circuit breaker - An automatic switch that stops the flow of electric current in a suddenly overloaded or otherwise abnormally stressed electric circuit.
Bundled Conductor	Two or more wires, connected in parallel through common switches, that act together to carry current in a single phase of an electric circuit.
Bus	Conductors that serve as a common connection for multiple transmission lines.

Cal-ISO	California Independent System Operator - The Cal-ISO is the FERC regulated control area operator of the Cal-ISO transmission grid. Its responsibilities include providing non-discriminatory access to the grid, managing congestion, maintaining the reliability and security of the grid, and providing billing and settlement services. The Cal-ISO has no affiliation with any market participant.
Cal-ISO Controlled Grid	The combined transmission assets of the Participating Transmission Owners (PTOs) that are collectively under the control of the Cal-ISO.
Cal-ISO Reliability Criteria	Reliability standards established by the NERC, WSCC, and the ISO, as amended from time to time, including any requirements of the NRC.
Cal-ISO Planning Process	Annual studies conducted by the PTO's and Cal-ISO in an open stakeholder process. These studies determine the future transmission reinforcements necessary to enable the ISO Controlled Grid to meet the ISO Reliability Criteria. The Cal-ISO Planning Process also includes studies of new resource connections and third party proposals for new additions to the ISO Controlled Grid.
Cal-ISO Tariff	Document filed with the appropriate regulatory authority (FERC) specifying lawful rates, charges, rules, and conditions under which the utilities provide services to parties. A tariff typically includes rate schedules, list of contracts, rules, and sample forms.
Capacitor	An electric device used to store charge temporarily, generally consisting of two metallic plates separated by a dielectric.
Cogeneration	The consecutive generation of thermal and electric or mechanical energy.
Conductor	The part of the transmission line (the wire) which carries the current.

Congestion

The condition that exists when market participants seek to dispatch in a pattern which would result in power flows that cannot be physically accommodated by the system. Although the system will not normally be operated in an overloaded condition, it may be described as congested based on requested/desired schedules.

Congestion Management

Congestion management is a Cal-ISO scheduling protocol that is used to resolve Congestion.

Contingency

Disconnection or separation, planned or forced, of one or more components from the electric system.

Day-Ahead Market

The forward market for the supply of electrical power at least 24 hours before delivery to Buyers and End-Use Customers.

Demand

Load plus any exports from an electric system.

Demand Forecast

An estimate of demand (electric load) over a designated period of time.

Dispatch

The operating control of an integrated electric system to: (i) assign specific generators and other sources of supply to effect the supply to meet the relevant area Demand taken as Load rises or falls; (ii) control operations and maintenance of high voltage lines, substations, and equipment, including administration of safety procedures; (iii) operate interconnections (iv) manage energy transactions with other interconnected Control Areas; and (v) curtail Demand.

dV/dQ

The partial derivative of the voltage at a bus with respect to the reactive injection at that bus. (See any elementary college calculus text for further discussion of partial derivatives.) The point at which dV/dQ approaches infinity is defined as the point of voltage collapse.

Emergency Condition

The system condition when one or more

	system elements are forced (not scheduled) out of service.
Emergency Overload	Loading of a transmission system element above its Emergency Rating during an Emergency Condition.
Emergency Rating	A special rating established for short term use in the event of a forced line or transformer outage (e.g., an emergency). An emergency rating may be expressed as a percentage of the normal rating (e.g., 115 percent of normal) or as an elevated current rating. For example, the normal rating for a conductor may be 1000 amperes and the emergency rating may be 1100 amperes.
Excessive Voltage Deviation	A sudden change in voltage at any substation as a result of a Contingency that exceeds established allowable levels of change.
Existing Transmission Contract (i.e., ETC)	A contract for transmission services that was in place prior to the start of ISO operations.
Fault Duty	The maximum amount of short-circuit current which must be interrupted by a given circuit breaker.
FERC	Federal Energy Regulatory Commission
General Order 95	California Public Utilities Commission (CPUC) General Order which specifies transmission line clearance requirements.
Generation Outlet Line	Transmission facilities (circuit, transformer, circuit breaker, etc.) linking generation to the main grid.
Generation Tie	Transmission facilities (circuit, transformer, circuit breaker, etc.) linking generation to the main grid.
GENERATOR	A machine capable of converting mechanical energy into electrical energy.
Heat Rate	The amount of energy input to an electric generator required to obtain a given value of energy output. Usually expressed in terms

	of British Thermal Units per kilowatt hour (Btu/kWh).
Hour-Ahead Market	The electric power futures market that is established 1-hour before delivery to End-Use Customers.
Imbalance Energy	Energy not scheduled in advance that is required to meet energy imbalances in real-time. This energy is supplied by Participating Generators under the Cal-ISO's control, providing spinning and non-spinning reserves, replacement reserves, and regulation, and other generators able to respond to the Cal-ISO's request for more or less energy.
Interconnected System Reliability	See Reliability.
Kcmil or kcm	One thousand circular mils. A unit of the conductor's cross sectional area which, when divided by 1,273, gives the area in square inches.
Kv	Kilovolt - A unit of potential difference, or voltage, between two conductors of a circuit, or between a conductor and the ground.
Load	The rate expressed in kilowatts, or megawatts, at which electric energy is delivered to or by a system, or part of a system to end use customers at a given instant or averaged over an designated interval of time. (Also see Demand.)
Load Factor	The average Load over a given period (e.g., one year) divided by the peak Load in the period.
Loop	An electrical connection where a line is opened and a new substation is inserted into the opening. A looped configuration creates two lines, one from each of the original end points to the new substation. A looped configuration is more reliable than a tap configuration because the looped configuration provides two lines into the substation rather than just one in a tap configuration. Also, see Tap below.

Low Voltage	Voltage at any substation that is below the minimum acceptable level.
Marginal Unit	The Generator (or Load) that sets the market clearing price in the ISO's Ancillary Services Market (or the Power Exchange's energy market). The marginal unit is the Generator or Load that had the highest accepted bid for energy or Demand reduction.
MVAr	Megavar - One megavolt ampere reactive (a measure of reactive power). Reactive power demand is generally associated with motor loads and this demand must be supplied by generation units or static reactive sources in the system.
MVA	Megavolt ampere - A unit of apparent power: equal to the product of the line voltage in kilovolts, the current in amperes, and the square root of 3 divided by 1000.
MW	Megawatt - A unit of power equivalent to 1,341 horsepower.
NERC	North American Electric Reliability Council
Nominal Voltage	Also known as Normal Voltage. The voltage at which power can be delivered to loads without damage to customer equipment or violation of Cal-ISO Reliability Criteria when the system is under Normal Operation.

Normal Operation When all customers receive the power they are entitled to without interruption and at steady voltage, and no element of the transmission system is loaded beyond its continuous rating.

NRC Nuclear Regulatory Commission

N-1 Contingency A forced outage of one system element (e.g., a transmission line or generator).

N-2 Contingency A forced outage of two system elements usually (but not exclusively) caused by one single event. Examples of an N-2 Contingency include loss of two transmission circuits on a single tower line or loss of two elements connected by a common circuit breaker due to the failure of that common breaker.

Operational Transfer Capability (i.e., OTC) The maximum amount of power which can be reliably transmitted over an electrical path in conjunction with the simultaneous reliable operation of all other paths. This limit is typically defined by seasonal operating studies, and should not be confused with a path rating. Also referred to as OTC.

Outlet Transmission facilities (circuit, transformer, circuit breaker, etc.) linking generation to the main grid.

Participating Generator A generator that has signed an agreement with the Cal-ISO to abide by the rules and conditions specified in the Cal-ISO Tariff.

Participating Transmission Owner (i.e., PTO) A Participating Transmission Owner is an electric transmission owning company that has turned over operational control of some or all of their electric transmission facilities to the Cal-ISO. Currently, the three Participating Transmission Owners are PG&E, SCE, and SDG&E.

Path Rating The maximum amount of power which can be reliably transmitted over an electrical path under the best set of conditions. Path ratings are defined and specified in the WSCC Path Rating Catalog.

PG&E	Pacific Gas & Electric Company
PG&E Interconnection Handbook	Detailed instructions to new customers (either load or generation) on how to interconnect to the PG&E electric system.
Post-Transient Voltage Deviation	The change in voltage from pre-contingency to post-contingency conditions once the system has had time to readjust.
Power Flow	A generic term used to describe the type, direction, and magnitude of actual or simulated electrical power flows on electrical systems.
Power Flow Analysis	A power flow analysis is a forward looking computer simulation of all major generation and transmission system facilities that identifies overloaded circuits, transformers and other equipment as well as system voltage levels under both Normal and Emergency Conditions.
Pump	A hydroelectric generator that acts as a motor and pumps water stored in a reservoir to a higher elevation.
Q/V Curve	A graphical representation of the voltage a given substation bus as a function of the reactive injection at that bus.
RAS	Remedial Action Scheme - An automatic control provision (e.g., trip a generation unit to mitigate a circuit overload).
Reactive Power	The portion of apparent power that does no work in an alternating current circuit but must be available to operate certain types of electrical equipment. Reactive Power is most commonly supplied by generators or by electrostatic equipment, such as shunt capacitors.
Reactive Margin	Reactive Power must be available at all load buses to prevent voltage collapse. Reactive margin is the amount of additional reactive load, usually measured in MVAR's, which may be added at a particular bus before the

	system experiences voltage collapse.
Reactor	An electric device used to store electric current temporarily, generally consisting of a coil of wire wound around a magnetic core.
Real Power	Real power is the work-producing component of apparent power and is required to operate any electrical equipment that performs energy conversion. Examples of this electrical equipment would be a heater, a lamp, or a motor. Real power is usually metered in units of kilowatt-hours (kWh).
Real-Time Market	The competitive generation market controlled and coordinated by the Cal-ISO for arranging real-time imbalance power.
Reconductor	The removal of old conductors on a transmission or distribution line followed by replacement of these conductors with new higher capacity conductors.
Reliability	The degree of performance of the elements of the bulk electric system that results in electricity being delivered to customers within accepted standards and in the amount desired. May be measured by the frequency, duration, and magnitude of adverse effects on the electric supply.
Reliability Criteria	Principals used to design, plan, operate, and assess the actual or projected reliability of an electric system.
Reliability Must-Run (i.e., RMR)	The minimum generation (number of units or MW output) required by the Cal-ISO to be on line to maintain system reliability in a local area.
SCE	Southern California Edison Company
SDG&E	San Diego Gas and Electric Company
Sensitivity Study	An analysis to determine the impact of varying one or more parameters on the results of the original analysis.

Series Capacitor	A static electrical device that is connected in-line with a transmission circuit that allows for higher power transfer capability by reducing the circuit's overall impedance.
Shunt Capacitor	A static electrical device that is connected between an electrical conductor and ground. A shunt capacitor normally will increase the voltage on a transmission circuit by providing reactive power to the electrical system.
Single Contingency	See N-1 Contingency.
Solid Dielectric Cable	Copper or aluminum conductors that are insulated by solid polyethylene type insulation and covered by a metallic shield and outer polyethylene jacket.
Source or Sink of Reactive Power	A source of Reactive Power is a device that injects reactive power into the power system (e.g., a Generator or a Capacitor). A sink of Reactive Power absorbs reactive power from the power system. Examples of reactive power sinks are shunt Reactors and motor loads.
Static Compensator	StatCom - a shunt connected power system device that includes Capacitors and Reactors controlled by solid state electronic devices as opposed to mechanically operated switches.
Substation	An assemblage of equipment that switches, changes, or regulates voltage in the electric transmission and distribution system.
Switchyard	A substation that is used as an outlet for one or more electric generators.
Switched Reactive Devices	A shunt Capacitor or shunt Reactor controlled by mechanically operated switches.
Switching Station	Similar to a substation, but there is only one voltage level.
Synchronous Condenser	A rotating mechanical device very similar to a Generator. The Synchronous Condenser

	has no mechanical power input and cannot produce Real Power. It can only produce or absorb Reactive Power.
System Reliability	See "Reliability".
Tap	An electrical connection where a new line is connected to an intermediate point on an existing transmission line and a new substation is connected to the end of the new line. A tapped configuration creates a single transmission circuit with more than two end points (for example, a "T"). A tapped configuration is less reliable than a looped configuration because a fault on any portion of the tapped circuit causes a complete loss of power to the new substation. Also, see Loop above.
Tap Changing Transformer	A Transformer that has the ability change the number of windings in service. By changing the number of windings in service (by moving to a different tap), the Tap Changing Transformer has the ability to maintain a nearly constant voltage at its output terminals even though the input voltage to the Transformer may vary.
Thermal Loading Capability	The current-carrying capacity (in Amperes) of a conductor at specified ambient conditions, at which damage to the conductor is non-existent or deemed acceptable based on economic, safety, and reliability considerations.
Thermal overload	A thermal overload occurs when electrical equipment is operated in excess of its current carrying capability. Overloads are generally given in percent. For example, a transmission line may be said to be loaded to 105 percent of its rating.
Thermal rating	See Ampacity.
Transformer	A device that changes the voltage of alternating current electricity.

Transformer Loading Capability	The current-carrying capacity (in Amperes) of a transformer at specified ambient conditions, at which damage to the transformer is non-existent or deemed acceptable based on economic, safety, and reliability considerations.
TSE	Transmission System Engineering.
Underbuild	A transmission or distribution configuration where a transmission or distribution circuit is attached to a transmission tower or pole below (under) the principle transmission line conductors.
Undercrossing	A transmission configuration where a transmission line crosses below the conductors of another transmission line, generally at 90 degrees.
VAr	One Volt ampere reactive. Also see the definition for MVar.
Voltage	Electromotive force or potential difference.
Voltage Collapse	The point at which the reactive demand at a substation bus exceeds the reactive supply at that bus. When the reactive demand is greater than the supply, the voltage at that point in the system will drop. Eventually, the voltage will drop to a point at which it is no longer possible to serve load at that bus.
Wheeling	A service provided by an entity, such as a utility, that owns transmission facilities whereby it receives electric energy into its system from one party and then uses its system to deliver that energy to a third party. The wheeling entity is usually paid a fee for this service.
WSCC	Western Systems Coordinating Council

Figure 1: PG&E Transmission Planning Areas

Figure 2:

GENERAL CONDITIONS COMPLIANCE MONITORING AND CLOSURE PLAN

Testimony of Steve Munro

INTRODUCTION

The project General Conditions Including Compliance Monitoring and Closure Plan (Compliance Plan) has been established as required by Public Resources Code section 25532. The plan provides a means for assuring that the facility is constructed, operated and closed in conjunction with air and water quality, public health and safety, environmental and other applicable regulations, guidelines, and conditions adopted or established by the California Energy Commission (Energy Commission) and specified in the written decision on the Application for Certification or otherwise required by law.

The Compliance Plan is composed of the following elements:

1. General conditions that:
 - a. set forth the duties and responsibilities of the Compliance Project Manager (CPM), the project owner, delegate agencies, and others;
 - b. set forth the requirements for handling confidential records and maintaining the compliance record;
 - c. state procedures for settling disputes and making post-certification changes; and
 - d. state the requirements for periodic compliance reports and other administrative procedures that are necessary to verify the compliance status for all Energy Commission approved conditions; and
 - e. establish requirements for facility closure plans.
2. Specific conditions of certification:

Specific conditions of certification that follow each technical area contain the measures required to mitigate any and all potential adverse project impacts associated with construction, operation and closure to an insignificant level. Each specific condition of certification also includes a verification provision that describes the method of verifying that the condition has been satisfied.

GENERAL CONDITIONS OF CERTIFICATION

COMPLIANCE PROJECT MANAGER (CPM) RESPONSIBILITIES

A CPM will oversee the compliance monitoring and shall be responsible for:

1. ensuring that the design, construction, operation, and closure of the project facilities is in compliance with the terms and conditions of the Commission Decision;
2. resolving complaints;

3. processing post-certification changes to the conditions of certification, project description, and ownership or operational control;
4. documenting and tracking compliance filings; and,
5. ensuring that the compliance files are maintained and accessible.

The CPM is the contact person for the Energy Commission and will consult with appropriate responsible agencies and the Energy Commission when handling disputes, complaints and amendments.

All project compliance submittals are submitted to the CPM for processing. Where a submittal required by a condition of certification requires CPM approval, it should be understood that the approval would involve all appropriate staff and management.

The Commission has established a toll free compliance telephone number of **1-800-858-0784** for the public to contact the Commission about power plant construction or operation-related questions, complaints or concerns.

PRE-CONSTRUCTION AND PRE-OPERATION COMPLIANCE MEETING

The CPM may schedule pre-construction and pre-operation compliance meetings prior to the projected start-dates of construction, plant operation, or both. The purpose of these meetings will be to assemble both the Energy Commission's and the project owner's technical staff to review the status of all pre-construction or pre-operation requirements contained in the Energy Commission's conditions of certification to confirm that they have been met, or if they have not been met, to ensure that the proper action is taken. In addition, these meetings shall ensure, to the extent possible, that Energy Commission conditions will not delay the construction and operation of the plant due to oversight or inadvertence and to preclude any last minute, unforeseen issues from arising. Pre-construction meetings held during the certification process may need to be publicly noticed unless they are confined to administrative issues and process.

ENERGY COMMISSION RECORD

The Energy Commission shall maintain as a public record, in either the Compliance file or Docket file, for the life of the project (or other period as required):

1. all documents demonstrating compliance with any legal requirements relating to the construction and operation of the facility;
2. all monthly and annual compliance reports filed by the project owner;
3. all complaints of noncompliance filed with the Energy Commission; and,
4. all petitions for project or condition changes and the resulting staff or Energy Commission action taken.

PROJECT OWNER RESPONSIBILITIES

It is the responsibility of the project owner to ensure that the general compliance conditions and the conditions of certification are satisfied. The general compliance conditions regarding post-certification changes specify measures that the project owner must take when requesting changes in the project design, compliance

conditions, or ownership. Failure to comply with any of the conditions of certification or the general compliance conditions may result in reopening of the case and revocation of Energy Commission certification, an administrative fine, or other action as appropriate.

ACCESS

The CPM, responsible Energy Commission staff, and delegate agencies or consultants, shall be guaranteed and granted unrestricted access to the power plant site, related facilities, project-related staff, and the records maintained on site, for the purpose of conducting audits, surveys, inspections, or general site visits. Although the CPM will normally schedule site visits on dates and times agreeable to the project owner, the CPM reserves the right to make unannounced visits at any time.

COMPLIANCE RECORD

The project owner shall maintain project files on-site or at an alternative site approved by the CPM, for the life of the project. The files shall contain copies of all “as-built” drawings, all documents submitted as verification for conditions, and all other project-related documents for the life of the project, unless a lesser period is specified by the conditions of certification.

Energy Commission staff and delegate agencies shall, upon request to the project owner, be given unrestricted access to the files.

COMPLIANCE VERIFICATIONS

Each condition of certification is followed by a means of “verification”. The verification describes the Energy Commission’s procedure(s) to ensure post-certification compliance with adopted conditions. The verification procedures, unlike the conditions, may be modified, as necessary by the CPM, and in most cases without full Energy Commission approval.

Verification of compliance with the conditions of certification can be accomplished by:

- reporting on the work done and providing the pertinent documentation in monthly and/or annual compliance reports filed by the project owner or authorized agent as required by the specific conditions of certification;
- appropriate letters from delegate agencies verifying compliance;
- Energy Commission staff audit of project records; and/or
- Energy Commission staff inspection of mitigation and/or other evidence of mitigation.

Verification lead times (e.g., 90,60 and 30-days) associated with start of construction may require the project owner to file submittals during the certification process, particularly if construction is planned to commence shortly after certification.

A cover letter from the project owner or authorized agent is required for all compliance submittals and correspondence pertaining to compliance matters. **The cover letter subject line shall identify the involved condition(s) of certification by condition number and include a brief description of the subject of the submittal.** The project owner shall also identify those submittals **not** required by a condition of certification with a statement such as: "This submittal is for information only and is not required by a specific condition of certification." When submitting supplementary or corrected information, the project owner shall reference the date of the previous submittal.

The project owner is responsible for the delivery and content of all verification submittals to the CPM, whether such condition was satisfied by work performed by the project owner or an agent of the project owner.

All submittals shall be addressed as follows:

**Compliance Project Manager
California Energy Commission
1516 Ninth Street (MS-2000)
Sacramento, CA 95814**

If the project owner desires Energy Commission staff action by a specific date, they shall so state in their submittal and include a detailed explanation of the effects on the project if this date is not met.

COMPLIANCE REPORTING

There are two different compliance reports that the project owner must submit to assist the CPM in tracking activities and monitoring compliance with the terms and conditions of the Commission Decision. During construction, the project owner or authorized agent will submit Monthly Compliance Reports. During operation, an Annual Compliance Report must be submitted. These reports, and the requirement for an accompanying compliance matrix, are described below. The majority of the conditions of certification require that compliance submittals be submitted to the CPM in the monthly or annual compliance reports.

COMPLIANCE MATRIX

A compliance matrix shall be submitted by the project owner to the CPM along with each monthly and annual compliance report. The compliance matrix is intended to provide the CPM with the current status of all compliance conditions in a spreadsheet format. The compliance matrix must identify:

1. the technical area,
2. the condition number,
3. a brief description of the verification action or submittal required by the condition,
4. the date the submittal is required (e.g., 60 days prior to construction, after final inspection, etc.),
5. the expected or actual submittal date,

6. the date a submittal or action was approved by the Chief Building Official (CBO), CPM, or delegate agency, if applicable, and
7. the compliance status for each condition (e.g., “not started”, “in progress” or “completed date”).

Completed or satisfied conditions do not need to be included in the compliance matrix after they have been identified as completed/satisfied in at least one monthly or annual compliance report.

PRE-CONSTRUCTION MATRIX

Prior to commencing construction a compliance matrix addressing only those conditions that must be fulfilled before the start of construction shall be submitted by the project owner to the CPM. This matrix will be included with the project owner's **first** compliance submittal. It will be in the same format as the compliance matrix referenced above.

TASKS PRIOR TO START OF CONSTRUCTION

Construction shall not commence until the pre-construction matrix is submitted, all pre-construction conditions have been complied with, and the CPM has issued a letter to the project owner authorizing construction. Project owners frequently anticipate starting project construction as soon as the project is certified. In some cases it may be necessary for the project owner to file submittals prior to certification if the required lead-time extends beyond the date anticipated for start of construction. It is also important that the project owner understand that pre-construction activities that are initiated prior to certification are performed at the owner's own risk. Failure to allow specified lead-time may cause delays in start of construction.

Various lead times for verification submittals to the CPM for conditions of certification are established to allow sufficient staff time to review and comment, and if necessary, allow the project owner to revise the submittal in a timely manner. This will ensure that project construction may proceed according to schedule.

MONTHLY COMPLIANCE REPORT

The first Monthly Compliance Report is due the month following the Energy Commission business meeting date that the project was approved, unless the otherwise agreed to by the CPM. The first Monthly Compliance Report shall include an initial list of dates for each of the events identified on the Key Events List. The Key Events List is found at the end of this section.

During pre-construction and construction of the project, the project owner or authorized agent shall submit an original and five copies of the Monthly Compliance Report within 10 working days after the end of each reporting month. The project owner shall also send a copy of each Monthly Compliance Report to the public library nearest the project site. Monthly Compliance Reports shall be clearly identified for the month being reported. The reports shall contain at a minimum:

1. a summary of the current project construction status, a revised/updated schedule if there are significant delays, and an explanation of any significant changes to the schedule;
2. documents required by specific conditions to be submitted along with the Monthly Compliance Report. Each of these items must be identified in the transmittal letter, and should be submitted as attachments to the Monthly Compliance Report;
3. an initial, and thereafter updated, compliance matrix which shows the status of all conditions of certification (fully satisfied and/or closed conditions do not need to be included in the matrix after they have been reported as closed);
4. a list of conditions which have been satisfied during the reporting period, and a description or reference to the actions which satisfied the condition;
5. a list of any submittal deadlines that were missed accompanied by an explanation and an estimate of when the information will be provided;
6. a cumulative listing of any approved changes to conditions of certification;
7. a listing of any filings with, or permits issued by, other governmental agencies during the month;
8. a projection of project compliance activities scheduled during the next two months. The project owner shall notify the CPM as soon as any changes are made to the project construction schedule that would affect compliance conditions of certification;
9. a listing of the month's additions to the on-site compliance file; and
10. any requests to dispose of items that are required to be maintained in the project owner's compliance file.
11. a listing of complaints, notices of violation, official warnings, and citations received during the month; a description of the resolution of any complaints which have been resolved, and the status of any unresolved complaints.

ANNUAL COMPLIANCE REPORT

After the air district has issued a Permit to Operate, the project owner shall submit Annual Compliance Reports instead of Monthly Compliance Reports. The reports are for each year of commercial operation and are due to the CPM each year at a date agreed to by the CPM. The project owner shall also send a copy of each Monthly Compliance Report to the public library nearest the project site. Each Annual Compliance Report shall identify the reporting period and shall contain the following:

1. an updated compliance matrix which shows the status of all conditions of certification (fully satisfied and/or closed conditions do not need to be included in the matrix after they have been reported as closed);
2. a summary of the current project operating status and an explanation of any significant changes to facility operations during the year;
3. documents required by specific conditions to be submitted along with the Annual Compliance Report. Each of these items must be identified in the transmittal letter, and should be submitted as attachments to the Annual Compliance Report;
4. a cumulative listing of all post-certification changes approved by the Energy Commission or cleared by the CPM;

5. an explanation for any submittal deadlines that were missed, accompanied by an estimate of when the information will be provided;
6. a listing of filings made to, or permits issued by, other governmental agencies during the year;
7. a projection of project compliance activities scheduled during the next year;
8. a listing of the year's additions to the on-site compliance file, and
9. an evaluation of the on-site contingency plan for unexpected facility closure, including any suggestions necessary for bringing the plan up to date [see General Conditions for Facility Closure addressed later in this section].
10. a listing of complaints, notices of violation, official warnings, and citations received during the year; a description of the resolution of any complaints which have been resolved, and the status of any unresolved complaints.

CONFIDENTIAL INFORMATION

Any information, which the project owner deems confidential shall be submitted to the Energy Commission's Docket with an application for confidentiality pursuant to Title 20, California Code of Regulations, section 2505(a). Any information, which is determined to be confidential, shall be kept confidential as provided for in Title 20, California Code of Regulations, section 2501 et. seq.

DEPARTMENT OF FISH AND GAME FILING FEE

Pursuant to the provisions of Fish and Game Code Section 711.4, the project owner shall pay a filing fee in the amount of eight hundred and fifty dollars (\$850). The payment instrument shall be provided to the Commission's Project Manager at the time of project certification and shall be made payable to the California Department of Fish and Game. The Commission's Project Manager will submit the payment to the Office of Planning and Research at the time of filing of the notice of decision pursuant to Public Resources Code Section 21080.5.

PERIODIC COMMUNITY MEETINGS

Prior to and during construction, the project owner shall conduct community meetings at appropriate locations of its choosing at a frequency it shall determine to be necessary in consultation with the CPM. The purpose of these meetings shall be to inform the public of construction plans or events of potential interest or concern to residents and other interested parties that are located near the project site. The public shall be afforded the opportunity to comment on project activities and plans. The CPM shall be invited to attend these meetings.

REPORTING OF COMPLAINTS, NOTICES, AND CITATIONS

Prior to the start of construction, the project owner must send a letter to property owners living within one mile of the project notifying them of a telephone number to contact project representatives with questions, complaints or concerns. If the telephone is not staffed 24 hours per day, it shall include automatic answering, with date and time stamp recording. The notice shall also contain the Energy Commission's toll-free compliance number. These telephone numbers shall be posted at the project site and easily visible to passersby during construction and operation.

In addition to the monthly and annual compliance reporting requirements described above, the project owner shall report and provide copies of all complaint forms, notices of violation, notices of fines, official warnings, and citations, within 10 days of receipt, to the CPM. Complaints shall be logged and numbered. Noise complaints shall be recorded on the form provided in the **NOISE** conditions of certification. All other complaints shall be recorded on complaint form on the following page.

FACILITY CLOSURE

At some point in the future, the project will cease operation and close down. At that time, it will be necessary to ensure that the closure occurs in such a way that public health and safety and the environment are protected from adverse impacts. Although the project setting for this project does not appear, at this time, to present any special or unusual closure problems, it is impossible to foresee what the situation will be in 30 years or more when the project ceases operation. Therefore, provisions must be made which provide the flexibility to deal with the specific situation and project setting which will exist at the time of closure. LORS pertaining to facility closure are identified in the sections dealing with each technical area. Facility closure will be consistent with LORS in effect at the time of closure.

There are at least three circumstances in which a facility closure can take place, planned closure, unexpected temporary closure and unexpected permanent closure.

PLANNED CLOSURE

This planned closure occurs at the end of a project's life, when the facility is closed in an anticipated, orderly manner, at the end of its useful economic or mechanical life, or due to gradual obsolescence.

UNEXPECTED TEMPORARY CLOSURE

This unplanned closure occurs when the facility is closed suddenly and/or unexpectedly, on a short-term basis, due to unforeseen circumstances such as a natural disaster, or an emergency.

UNEXPECTED PERMANENT CLOSURE

This unplanned closure occurs if the project owner closes the facility suddenly and/or unexpectedly, on a permanent basis. This includes unexpected closure where the owner remains accountable for implementing the on-site contingency plan. It can also include unexpected closure where the project owner is unable to implement the contingency plan, and the project is essentially abandoned.

COMPLAINT REPORT/RESOLUTION FORM

PROJECT NAME:

AFC Number:

COMPLAINT LOG NUMBER _____

Complainant's name and address:

Phone number:

Date and time complaint received:

Indicate if by telephone or in writing (attach copy if written):

Date of first occurrence:

Description of complaint (including dates, frequency, and duration):

Findings of investigation by plant personnel:

Indicate if complaint relates to violation of a CEC requirement:

Date complainant contacted to discuss findings:

Description of corrective measures taken or other complaint resolution:

Indicate if complainant agrees with proposed resolution:

If not, explain:

Other relevant information:

If corrective action necessary, date completed:

ached)

ached)

This information is certified to be correct.

Plant Manager's Signature: _____ Date: _____

(Attach additional pages and supporting documentation, as required.)

GENERAL CONDITIONS FOR FACILITY CLOSURE

PLANNED CLOSURE

In order that a planned facility closure does not create adverse impacts, a closure process, that will provide for careful consideration of available options and applicable laws, ordinances, regulations, standards, and local/regional plans in existence at the time of closure, will be undertaken. To ensure adequate review of a planned project closure, the project owner shall submit a proposed facility closure plan to the Energy Commission for review and approval at least twelve months prior to commencement of closure activities (or other period of time agreed to by the CPM). The project owner shall file 120 copies (or other number of copies agreed upon by the CPM) of a proposed facility closure plan with the Energy Commission. The plan shall:

1. identify and discuss any impacts and mitigation to address significant adverse impacts associated with proposed closure activities and to address facilities, equipment, or other project related remnants that will remain at the site.
2. identify a schedule of activities for closure of the power plant site, transmission line corridor, and all other appurtenant facilities constructed as part of the project;
3. identify any facilities or equipment intended to remain on site after closure, the reason, and any future use; and
4. address conformance of the plan with all applicable laws, ordinances, regulations, standards, local/regional plans in existence at the time of facility closure, and applicable conditions of certification.

Also, in the event that there are significant issues associated with the proposed facility closure plan's approval, or the desires of local officials or interested parties are inconsistent with the plan, the CPM shall hold one or more workshops and/or the Commission may hold public hearings as part of its approval procedure.

In addition, prior to submittal of the proposed facility closure plan, a meeting shall be held between the project owner and the Commission CPM for the purpose of discussing the specific contents of the plan.

As necessary, prior to, or during the closure plan process, the project owner shall take appropriate steps to eliminate any immediate threats to public health and safety or the environment, but shall not commence any other closure activities, until Commission approval of the facility closure plan is obtained.

UNEXPECTED TEMPORARY CLOSURE

In order to ensure that public health and safety and the environment are protected in the event of an unexpected temporary facility closure, it is essential to have an on-site contingency plan in place. The on-site contingency plan will help to ensure that all necessary steps to mitigate public health and safety, and environmental impacts, are taken in a timely manner.

The project owner shall submit an on-site contingency plan for CPM review and approval. The plan shall be submitted no less than 60 days (or other time agreed to by the CPM) prior to commencement of commercial operation. The approved plan must be in place prior to commercial operation of the facility and shall be kept at the site at all times.

The project owner, in consultation with the CPM, will update the on-site contingency plan as necessary. The CPM may require revisions to the on-site contingency plan over the life of the project. In the annual compliance reports submitted to the Energy Commission, the project owner will review the on-site contingency plan, and recommend changes to bring the plan up to date. Any changes to the plan must be approved by the CPM.

The on-site contingency plan shall provide for taking immediate steps to secure the facility from trespassing or encroachment. In addition, for closures of more than 90 days (unless other arrangements are agreed to by the CPM), the plan shall provide for removal of hazardous materials and hazardous wastes, draining of all chemicals from storage tanks and other equipment and the safe shutdown of all equipment (also see specific conditions of certification for the technical areas of Hazardous Materials Management and Waste Management).

In addition, consistent with requirements under unexpected permanent closure addressed below, the nature and extent of insurance coverage, and major equipment warranties must also be included in the on-site contingency plan. In addition, the status of the insurance coverage and major equipment warranties must be updated in the annual compliance reports.

In the event of an unexpected temporary closure, the project owner shall notify the CPM, as well as other responsible agencies, by telephone, fax, e-mail, etc., within 24 hours and shall take all necessary steps to implement the on-site contingency plan. The project owner shall keep the CPM informed of circumstances and expected duration of the closure.

If the CPM determines that a temporary closure is likely to be permanent, or for a duration of more than twelve months, a closure plan consistent with that for a planned closure shall be developed and submitted to the CPM within 90 days of the CPM's determination (or other period of time agreed to by the CPM).

UNEXPECTED PERMANENT CLOSURE

The on-site contingency plan required for unexpected temporary closure shall also cover unexpected permanent facility closure. All of the requirements specified for unexpected temporary closure shall also apply to unexpected permanent closure.

In addition, the on-site contingency plan shall address how the project owner will ensure that all required closure steps will be successfully undertaken in the unlikely event of abandonment.

In the event of an unexpected permanent closure, the project owner shall notify the CPM, as well as other responsible agencies, by telephone, fax, e-mail, etc., within 24 hours and shall take all necessary steps to implement the on-site contingency plan. The project owner shall keep the CPM informed of the status of all closure activities.

A closure plan consistent with that for a planned closure shall be developed and submitted to the CPM within 90 days of the permanent closure (or other period of time agreed to by the CPM).

DELEGATE AGENCIES

To the extent permitted by law, the Energy Commission may delegate authority for compliance verification and enforcement to various state and local agencies that have expertise in subject areas where specific requirements have been established as a condition of certification. If a delegate agency does not participate in this program, the Energy Commission staff will establish an alternative method of verification and enforcement. Energy Commission staff reserves the right to independently verify compliance.

In performing construction and operation monitoring of the project, the Energy Commission staff acts as, and has the authority of, the Chief Building Official (CBO). The Commission staff retains this authority when delegating to a local CBO. Delegation of authority for compliance verification includes the authority for enforcing codes, the responsibility for code interpretation where required, and the authority to use discretion as necessary, in implementing the various codes and standards.

Whenever an agency's responsibility for a particular area is transferred by law to another entity, all references to the original agency shall be interpreted to apply to the successor entity.

ENFORCEMENT

The Energy Commission's legal authority to enforce the terms and conditions of its Decision is specified in Public Resources Code sections 25534 and 25900. The Energy Commission may amend or revoke the certification for any facility, and may impose a civil penalty for any significant failure to comply with the terms or conditions of the Commission Decision. The specific action and amount of any fines the Commission may impose would take into account the specific circumstances of the incident(s). This would include such factors as the previous compliance history, whether the cause of the incident involves willful disregard of LORS, inadvertence, unforeseeable events, and other factors the Commission may consider.

Moreover, to ensure compliance with the terms and conditions of certification and applicable laws, ordinances, regulations, and standards, delegate agencies are

authorized to take any action allowed by law in accordance with their statutory authority, regulations, and administrative procedures.

NONCOMPLIANCE COMPLAINT PROCEDURES

Any person or agency may file a complaint alleging noncompliance with the conditions of certification. Such a complaint will be subject to review by the Energy Commission pursuant to Title 20, California Code of Regulations, section 1230 et. seq., but in many instances the noncompliance can be resolved by using the informal dispute resolution process. Both the informal and formal complaint procedure, as described in current State law and regulations, are described below. They shall be followed unless superseded by current law or regulations.

INFORMAL DISPUTE RESOLUTION PROCEDURE

The following procedure is designed to informally resolve disputes concerning interpretation of compliance with the requirements of this compliance plan. The project owner, the Energy Commission, or any other party, including members of the public, may initiate this procedure for resolving a dispute. Disputes may pertain to actions or decisions made by any party including the Energy Commission's delegate agents.

This procedure may precede the more formal complaint and investigation procedure specified in Title 20, California Code of Regulations, section 1230 et. seq., but is not intended to be a substitute for, or prerequisite to it. This informal procedure may not be used to change the terms and conditions of certification as approved by the Energy Commission, although the agreed upon resolution may result in a project owner, or in some cases the Energy Commission staff, proposing an amendment.

The procedure encourages all parties involved in a dispute to discuss the matter and to reach an agreement resolving the dispute. If a dispute cannot be resolved, then the matter must be referred to the full Energy Commission for consideration via the complaint and investigation process. The procedure for informal dispute resolution is as follows:

REQUEST FOR INFORMAL INVESTIGATION

Any individual, group, or agency may request the Energy Commission to conduct an informal investigation of alleged noncompliance with the Energy Commission's terms and conditions of certification. All requests for informal investigations shall be made to the designated CPM.

Upon receipt of a request for informal investigation, the CPM shall promptly notify the project owner of the allegation by telephone and letter. All known and relevant information of the alleged noncompliance shall be provided to the project owner and to the Energy Commission staff. The CPM will evaluate the request and the information to determine if further investigation is necessary. If the CPM finds that further investigation is necessary, the project owner will be asked to promptly investigate the matter and within seven (7) working days of the CPM's request, provide a written report of the results of the investigation, including corrective

measures proposed or undertaken, to the CPM. Depending on the urgency of the noncompliance matter, the CPM may conduct a site visit and/or request the project owner to provide an initial report, within forty-eight (48) hours, followed by a written report filed within seven (7) days.

REQUEST FOR INFORMAL MEETING

In the event that either the party requesting an investigation or the Energy Commission staff is not satisfied with the project owner's report, investigation of the event, or corrective measures undertaken, either party may submit a written request to the CPM for a meeting with the project owner. Such request shall be made within fourteen (14) days of the project owner's filing of its written report. Upon receipt of such a request, the CPM shall:

1. immediately schedule a meeting with the requesting party and the project owner, to be held at a mutually convenient time and place;
2. secure the attendance of appropriate Energy Commission staff and staff of any other agency with expertise in the subject area of concern as necessary;
3. conduct such meeting in an informal and objective manner so as to encourage the voluntary settlement of the dispute in a fair and equitable manner; and,
4. after the conclusion of such a meeting, promptly prepare and distribute copies to all in attendance and to the project file, a summary memorandum which fairly and accurately identifies the positions of all parties and any conclusions reached. If an agreement has not been reached, the CPM shall inform the complainant of the formal complaint process and requirements provided under Title 20, California Code of Regulations, section 1230 et. seq.

FORMAL DISPUTE RESOLUTION PROCEDURE-COMPLAINTS AND INVESTIGATIONS

If either the project owner, Energy Commission staff, or the party requesting an investigation is not satisfied with the results of the informal dispute resolution process, such party may file a complaint or a request for an investigation with the Energy Commission's General Counsel. Disputes may pertain to actions or decisions made by any party including the Energy Commission's delegate agents. Requirements for complaint filings and a description of how complaints are processed are in Title 20, California Code of Regulations, section 1230 et. seq.

The Chairman, upon receipt of a written request stating the basis of the dispute, may grant a hearing on the matter, consistent with the requirements of noticing provisions. The Commission shall have the authority to consider all relevant facts involved and make any appropriate orders consistent with its jurisdiction (Title 20, California Code of Regulations, sections 1232 - 1236).

POST CERTIFICATION CHANGES TO THE COMMISSION DECISION: AMENDMENTS, INSIGNIFICANT PROJECT CHANGES AND VERIFICATION CHANGES

The project owner must petition the Energy Commission, pursuant to Title 20, California Code of Regulations, section 1769, to 1) delete or change a condition of certification; 2) modify the project design or operational requirements; and 3) transfer ownership or operational control of the facility.

A petition is required for **amendments** and for **insignificant project changes**. For verification changes, a letter from the project owner is sufficient. In all cases, the petition or letter requesting a change should be submitted to the Commission's Docket in accordance with Title 20, California Code of Regulations, section 1209. The criteria that determine which type of change process applies are explained below.

AMENDMENT

A proposed change will be processed as an amendment if it involves a change to the requirement or protocol (and in some cases the verification) portion of a condition of certification, an ownership or operator change, or a potential significant environmental impact.

INSIGNIFICANT PROJECT CHANGE

The proposed change will be processed as an insignificant project change if it does not require changing the language in a condition of certification, have a potential for significant environmental impact, and cause the project to violate laws, ordinances, regulations or standards.

VERIFICATION CHANGE

The proposed change will be processed as a verification change if it involves only the language in the verification portion of the condition of certification. This procedure can only be used to change verification requirements that are of an administrative nature, usually the timing of a required action. In the unlikely event that verification language contains technical requirements, the proposed change must be processed as an amendment.

KEY EVENT LIST

PROJECT _____ DATE ENTERED _____

DOCKET # _____ PROJECT MANAGER _____

<i>EVENT DESCRIPTION</i>	<i>DATE ASSIGNED</i>
Date of Certification	
Start of Construction	
Completion of Construction	
Start of Operation (1 st Turbine Roll)	
Start of Rainy Season	
End of Rainy Season	
Start T/L Construction	
Complete T/L Construction	
Start Fuel Supply Line Construction	
Complete Fuel Supply Line Construction	
Start Rough Grading	
Complete Rough Grading	
Start of Water Supply Line Construction	
Completion of Water Supply Line Construction	
Start Implementation of Erosion Control Measures	
Complete Implementation of Erosion Control Measures	

ALTERNATIVES

Testimony of Gary Walker

ALTERNATIVES

Testimony of Gary D. Walker

INTRODUCTION

The purpose of staff's alternatives analysis is to assess alternatives that could feasibly attain the project's objectives and avoid or substantially lessen one or more of the significant effects of the project. The analysis also identifies and compares the impacts of the various alternatives but in less detail than the proposed project. If the Energy Commission identifies an alternative that meets these criteria, it does not have the authority to approve the alternative or require Calpine/Bechtel to move the proposed project to another location. If a project is proposed at one of the alternative sites, a new Application for Certification must be filed on that site and a new review process would ensue.

CONCLUSIONS

Staff's alternatives analysis considered 17 sites to determine if any alternatives could feasibly attain most of the project's objectives and avoid or substantially lessen the significant unmitigated adverse impacts of the proposed project. Based on screening criteria, all but six of these sites were eliminated because of readily apparent impact or feasibility issues¹. Staff assessed in more detail the remaining six sites looking for significant impacts and "fatal flaws"².

The applicant's primary objectives for the project were selling electricity into California's electricity market, providing electric system reliability and transmission congestion benefits within the San Francisco Bay Area, and being on-line by the summer of 2002. None of the alternatives meet the objective of being on-line by the summer of 2002,³ assuming the additional time to complete site engineering and application preparation, one year for permitting, and two years for construction. The staff and the California Independent System operator believe this is an important objective in light of California's current electricity supply situation. Four of the alternative sites (Alt-1, Alt-2, Alt-3, and Alt-4) would achieve the remaining objectives to a greater or lesser degree than the proposed project.

¹ An important consideration in studying alternatives is site availability and site control. In this analysis, staff briefly investigated the availability of the various alternative sites and believes site control may be possible but this is in constant flux since many factors influence the availability of a specific site.

² A more rigorous AFC-level analysis of any of the alternative sites could reveal environmental impacts; non-conformity with laws, ordinances, regulations, and standards; or potential mitigation that were not identified during the more general alternatives analysis.

³ It is also unlikely that the proposed project will be able to begin operation in the summer of 2002 due to changes made in the project description by the applicant during the permitting process. The proposed project, however, could become operational approximately 18 to 30 months prior to any of the alternatives.

The Commission staff identified two significant adverse impacts associated with the proposed project in visual resources and land use. Based on the staff's general assessment, alternative site Alt-1 or Alt-2 will have significant adverse impacts associated with the loss of prime farmland and may have significant adverse cumulative visual impacts. These sites also have current land use noncompliance and would require a General Plan amendment and zoning change which may or may not be approved by the local government. They are feasible only if PG&E's proposed Los Esteros substation is approved and constructed. Alternative site Alt-3 or Alt-4, based on staff's general assessment, is expected to avoid the Metcalf projects significant impacts and may not result in any significant environmental impacts. These sites would not require a General Plan amendment but have current land use (height restrictions) noncompliance which may or may not be acceptable to the local government. Use of alternative site Alt-5 or Alt-6 is expected, based on this level of review, to avoid the significant unmitigated environmental impacts of the proposed project. They would not require a General Plan or zoning change and may cause significant adverse biological impacts to listed species, water supply impacts, and water discharge impacts.

The "no project" alternative would avoid most of the significant environmental impacts of the proposed project but may cause environmental impacts of its own that could be significant, including public health impacts. The no project alternative may have economic costs that the project would avoid and greater risk of economic and social costs. The no project alternative would not meet most of the objectives of the proposed project.

All other alternatives are either infeasible, would not avoid the significant impacts of the proposed project, or would cause greater environmental impacts than the proposed project. These include other alternative sites as well as technology alternatives and alternative generating capacities.

APPROACH

As a lead agency under CEQA, the Energy Commission is required to identify ways to mitigate or avoid the significant effects that a project may have on the environment (Public Resources Code Section 21002.1). The Commission staff used the "Guidelines for Implementation of the California Environmental Quality Act," as a guide in preparing this analysis. These guidelines state that the alternatives discussion "shall describe a range of reasonable alternatives to the project, or to the location of the project, which would feasibly attain most of the basic objectives of the project but would avoid or substantially lessen any of the significant effects of the project, and evaluate the comparative merits of the alternatives." (Cal. Code Regs., tit. 14, §1526.6(a).) This discussion "...shall focus on alternatives to the project or its location which are capable of avoiding or substantially lessening any significant effects of the project, even if these alternatives would impede to some degree the attainment of the project objectives, or would be more costly" (Cal Code Regs., tit. 14, §1526.6(a).) The guidelines also state that "the range of potential alternatives to the proposed project shall include

those that could feasibly accomplish most of the basic objectives of the project and could avoid or substantially lessen one or more of the significant effects.

The range of alternatives is governed by the “rule of reason” that requires the discussion “to set forth only of those alternatives necessary to permit a reasoned choice. The alternatives “shall be limited to ones that would avoid or substantially lessen any of the significant effects of the project.” (Id.) Of those alternatives “only the ones that the lead agency determines could feasibly obtain most of the basic objectives of the project” need to be examined in detail. (Id.) CEQA states that an environmental document does not have to consider an alternative whose effect cannot be reasonably ascertained and whose implementation is remote and speculative (Cal. Code Regs., tit. 14, § 15126.6(f)(3)).

This alternatives analysis uses the following approach, based on guidance in the CEQA Deskbook (1999):

1. Identify any potential significant environmental impacts of the project.
2. Describe the project objectives.
3. Consider a broad range of alternatives, including the “no project” alternative, and select a reasonable range of alternatives that:
 - a. Avoid or substantially lessen one or more of the potential significant effects of the project; and
 - b. Feasibly⁴ meet most of the basic objectives of the project.
4. If any alternatives are deemed infeasible, explain why.
5. Evaluate the environmental impacts of each feasible alternative.
6. Compare the feasible alternatives and the proposed project in regard to the environmental impacts that each would cause.
7. If the environmentally superior alternative is the “no project” alternative, identify an environmentally superior alternative among the other alternatives.

POTENTIAL SIGNIFICANT ENVIRONMENTAL IMPACTS OF THE PROPOSED PROJECT

In the FSA, staff identified that the Metcalf Energy Center has the potential to cause significant impacts to land use and visual resources. The following discussion summarizes those conclusions. (Staff’s detailed assessment of the expected environmental consequences of the proposed project is discussed in the individual sections of the Final Staff Assessment.)

LAND USE

The proposed project would convert 20 acres of prime farmland to a non-agricultural use and would not be compatible with nearby residences because of its significant visual impacts. Although the amount of loss is relatively small (20 acres) compared

⁴ Both the CEQA Guidelines and the Commission’s regulations define “feasible” as “capable of being accomplished in a successful manner within a reasonable period of time, taking into account economic, environmental, legal, social, and technological factors.” (Cal. Code Regs., tit. 14, § 15364; Cal Code Regs., tit. 20, § 1702(e).)

with other development proposed in Coyote Valley, it exceeds the level of significance established by the City of San Jose and Santa Clara County.

VISUAL RESOURCES

The proposed power plant would cause significant visual impacts to the residences along Blanchard Road and to the visual character of North Coyote Valley. The project would also contribute to significant cumulative visual impacts to North Coyote Valley. The project also would not conform to a number of visual resource policies in local land use plans, including the City of San Jose's General Plan, North Coyote Valley Campus Industrial Area Master Development Plan, and Riparian Corridor Policy Study; and the Santa Clara County General Plan.

PROJECT OBJECTIVES

Of the project objectives listed in the Application for Certification (AFC) (Calpine/Bechtel 1999a), staff has identified the following objectives relevant to evaluation of all alternatives:

1. Being on-line by the summer peak of 2002.
2. Providing [San Francisco] Bay Area electric grid reliability benefits.
3. Mitigating transmission congestion into the area.

IDENTIFICATION AND SCREENING OF POTENTIAL ALTERNATIVES

ALTERNATIVES IDENTIFIED AND CONSIDERED

Staff identified and considered a broad range of potential alternatives to the proposed project in selecting those that qualified for detailed evaluation. The alternatives identified and considered were:

- Alternative Sites
- Technology Alternatives
- Demand Side Management
- Distributed Generation
- Renewable Resources
- Solar
- Wind
- Biomass
- Hydropower
- Geothermal
- Alternative Generation Capacities

IDENTIFICATION AND SCREENING OF ALTERNATIVE SITES

Staff used a two-stage process, first identifying a reasonable range of alternative sites, and then screening these sites to select those that qualified for detailed evaluation. Staff considered alternative sites for the project that were identified by

several sources, including the applicant, members of the public, an electric system consultant to the City of Santa Clara, and Energy Commission staff (see **ALTERNATIVES Table 1**). Staff identified additional alternative sites through independent staff investigations.

ALTERNATIVE SITES IDENTIFIED BY THE APPLICANT

In the AFC (Calpine/Bechtel 1999a) the applicant identified and evaluated three alternative sites for the proposed power plant: sites A, B, and C (see **ALTERNATIVES Table 1** and **ALTERNATIVES Figure 1**). Staff has evaluated these three alternative sites. Sites A and B are addressed in Appendix A, which discusses infeasible alternatives. Sites A and C are addressed in the subsection that evaluates identified feasible alternative sites (see below). The AFC also discussed the feasibility of the site of Calpine's existing power plant in Gilroy.

ALTERNATIVE SITES IDENTIFIED BY OTHERS

In addition to the three sites identified by the applicant, staff evaluated five sites identified by others during the siting process and eight sites that staff identified.

Early in the AFC process members of the public asked that Energy Commission staff evaluate PG&E's Moss Landing Power Plant and Calpine's power plant at Gilroy Foods as alternative sites for the proposed project.

At an Energy Commission workshop on alternatives, a member of the public requested that staff consider an alternative site in the City of San Jose at the site of the former Stouffer chemical plant on Monterey Road just north of Curtner Avenue.

An electric system consultant to the City of Santa Clara suggested that staff consider three sites on land used by the City for electrical transmission facilities (Schwartz 2000). One site is at the Trimble Substation on First Street. Another is

ALTERNATIVES Table 1
Alternatives, Whether They Qualified for More Detailed Evaluation

ALTERNATIVE	QUALIFY?	IF NOT, WHY NOT?
Technology Alternatives		
Demand Side Management	No	<ul style="list-style-type: none"> • Already factored into electrical system planning
Distributed Generation	No	<ul style="list-style-type: none"> • Technological, market, and regulatory barriers; • Some types are infeasible; • Some types could cause significant environmental impacts
Renewable Resources	No	<ul style="list-style-type: none"> • Feasibility; • Availability, • Environmental impacts
Alternative Generation Capacities	No	<ul style="list-style-type: none"> • Feasibility
Alternative Sites		
Applicant's Alternative Sites		
Site A	No	<ul style="list-style-type: none"> • Greater environmental impacts
Site B	No	<ul style="list-style-type: none"> • Not available
Site C	No	<ul style="list-style-type: none"> • Greater environmental impacts; • Insufficient land
Sites Identified by Others		
Moss Landing	No	<ul style="list-style-type: none"> • Insufficient transmission capacity
Gilroy	No	<ul style="list-style-type: none"> • Insufficient land; • Insufficient transmission capacity
Stouffer Property	No	<ul style="list-style-type: none"> • Not available
City of Santa Clara Sites		
Trimble Substation	No	<ul style="list-style-type: none"> • Too small; • Insufficient transmission capacity
Scott Substation	No	<ul style="list-style-type: none"> • Too small; • Insufficient transmission capacity
Northern Receiving Station	No	<ul style="list-style-type: none"> • Adjacent to high-density residential area; • Insufficient transmission capacity
Sites Identified by Staff		
Monta Vista	No	<ul style="list-style-type: none"> • Not available
City of San Francisco Property	No	<ul style="list-style-type: none"> • Not available
Alt-1 (Cilker property)	Yes	-
Alt-1a (SJSCWTP property)	Yes	-
Alt-2 (Lin-Hom property)	Yes	-
Alt-3 (Borden property)	Yes	-
Alt-4 (Serra property)	Yes	-
Alt-5 (Tesla)	Yes	-
Alt-6 (Tesla)	Yes	-

ALTERNATIVES Figure 1
Map of 17 Identified Alternative Sites

at the Scott Receiving Station just north of Central Expressway. The third site is at the Northern Receiving Station on Lafayette Street.

ALTERNATIVE SITES IDENTIFIED BY STAFF

Staff identified eight potential alternative sites. One is a property near PG&E's Monta Vista Substation on the western outskirts of Cupertino. Another site is on land owned by the City of San Francisco's Public Utility Commission in unincorporated Santa Clara County, south of Sunol, east of Fremont, and southeast of Interstate 680. Two sites are in the northern San Jose area, north of State Route 237 near the San Jose – Santa Clara Waste Water Treatment Plant. Two sites are in the City of Fremont. Two sites are in rural eastern Alameda County, south of Interstate 580 and adjacent to PG&E's Tesla Substation.

STAFF'S ALTERNATIVE SITE IDENTIFICATION PROCESS

Staff considered the following criteria in identifying potential alternative sites.

1. Avoid or substantially lessen one or more of the potential significant effects of the project; and
2. Satisfy the following criteria:
 - a. Site suitability. Approximately 14 acres are required for the site. The shape of the site also affects its usability.
 - b. Availability of infrastructure. The site should be within a reasonable distance of the electric transmission system, natural gas supply, and water supply.
3. Availability of the site.
4. Compliance with General Plan designation and zoning district.
5. Not located adjacent to moderate or high density residential areas or to sensitive receptors (such as schools and hospitals) or to recreation areas.

Staff began by identifying an initial study region. The region consisted of the area within a reasonable distance of PG&E's Metcalf Substation. Staff chose this region to determine whether alternative sites (in addition to those identified by the applicant) were close enough to PG&E's Metcalf Substation to provide power to that substation, similar to the proposed project. Staff did not find any such sites, primarily due to land use constraints and the potential for significant visual impacts. Staff then expanded the study region to within a reasonable distance of any of the six 230 kV PG&E substations in the southern Bay Area that technical staff advised could accommodate the electricity generated by a power plant of the size proposed.⁵ The expanded study region surrounds the southern portion of San Francisco Bay, from Milbrae on the northwest to Fremont on the northeast (see **ALTERNATIVES Figure 1**).

⁵ The substations are Metcalf, Monta Vista, Jefferson, Newark, Ravenswood, and San Mateo.

To narrow the search, staff first identified areas that satisfied the criterion of general plan and zoning consistency. Staff examined the general plans, zoning ordinances, and related maps for all of the local jurisdictions in the study region. Staff then visited each of the areas with appropriate general plan designations and zoning to look for potential sites. Staff used two criteria to identify potential sites: 1) site suitability and 2) not located adjacent to moderate or high density residential areas or to sensitive receptors (such as schools and hospitals) or to recreation areas. For identified sites staff investigated availability of infrastructure and site availability.

Staff found that potential sites that could meet staff's criteria are rare. Almost all of the buildable land in the study area has been developed; few sites of adequate size exist. In addition, plans, policies, and ordinances of many local governments in the area either prohibit heavy industry (such as a power plant), discourage new heavy industrial facilities in areas currently devoted to heavy industry, or discourage expansion of heavy industry into areas where it is not currently the predominant land use. Because of the scarcity of sites in this region, staff also considered outlying areas, including Gilroy, Moss Landing, and eastern Alameda County, all near existing power plants or substations that connect directly to the study region.

SELECTION OF ALTERNATIVES FOR MORE DETAILED EVALUATION

SCREENING CRITERIA

To select alternatives for detailed evaluation, staff applied the two basic criteria specified in the CEQA Guidelines:

- Avoid or substantially lessen one or more of the proposed project's significant effects.
- Feasibly accomplish most of the basic project objectives.

For alternative sites, staff used the site identification criteria specified above to address feasibility.

ALTERNATIVE SITES THAT SATISFIED THE SCREENING CRITERIA

Staff identified six sites that satisfied the screening criteria and therefore qualified for more detailed evaluation as alternatives to the proposed site. ALTERNATIVES Figure 2 is a regional map showing the six alternative sites. The sites, designated Alt-1 through Alt-6, are described as follows.

ALTERNATIVES Figure 2
**Regional Map of the Six Alternative Sites that Qualified for Detailed
Evaluation**

ALT-1 AND ALT-2

Sites Alt-1 and Alt-2 (see **ALTERNATIVES Figure 3**) were originally identified by Calpine/Bechtel as potential sites for a power plant that would be adjacent to PG&E's proposed Los Esteros Substation in northern San Jose. A 230 kV substation and a double circuit 230 kV transmission line to Newark Substation, which the PG&E project would provide, are prerequisites for a project in this area with the generating capacity of MEC. On March 1, 1999, Calpine/Bechtel filed General Plan Amendment applications with the City of San Jose regarding the sites for development of a power plant. However, Calpine/Bechtel later withdrew those applications, citing uncertainty regarding the construction of the substation as one reason for the withdrawal. PG&E's application for the substation is currently in the review process before the CPUC. The anticipated release date of the Final EIR is November/December 2000 (CPUC 2000). The feasibility of these sites as alternatives to the proposed project is contingent on approval and construction of this substation.

The parcels containing the sites are currently in agricultural use. Both are designated Light Industrial by the San Jose General Plan and zoned Light Industrial. Power plants are not an allowed use in this General Plan designation and zoning district. The City recommended to Calpine/Bechtel that for a power plant at either site a General Plan Amendment should be requested to change the Light Industrial designation to Public/Quasi-Public.

Site Alt-1 is located approximately 2,400 feet north of State Route 237, east of Zanker Road and west of Coyote Creek (see **ALTERNATIVES Figure 3**). It consists of the northwestern 13 acres of a 66.46-acre parcel known locally as the Cilker property. The parcel is currently in agricultural use, and contains two farmhouses near its southern end.

Site Alt-1 is located close to the San Jose/Santa Clara Waste Water Treatment Plant (WWTP), which would serve as the source of recycled water for the project. A route to the treatment plant following existing roads would be approximately 4,000 feet long. A natural gas line runs adjacent to the site, with another line approximately 1,500 feet to the south of the site. Because the site is adjacent to the proposed site for PG&E's Los Esteros Substation, the length of the electrical transmission connection would be minimal.

Site Alt-2 is located adjacent to the north side of State Route 237, east of Zanker Road and west of Coyote Creek (see **ALTERNATIVES Figure 3**). It consists of the southern 30 acres of a 54.6-acre parcel known locally as the Lin/Hom property. The entire parcel is currently occupied by inactive greenhouses, agricultural facilities, and buildings that house residents engaged in agricultural work.

Site Alt-2 is located close to the San Jose/Santa Clara WWTP, which would serve as the source of recycled water for the project. A route to the treatment plant following existing roads would be approximately 6,000 feet long. A natural gas line runs adjacent to the site, with another line approximately 1,500 feet to the north of

ALTERNATIVES Figure 3
Staff's Alternative Sites Alt-1 and Alt-2

the site. Because the site is adjacent to the proposed site for PG&E's Los Esteros Substation, the length of the electrical transmission connection would be minimal.

ALT-3

Site Alt-3 is located on a parcel of land that is partially occupied by the existing Borden Chemical facility on Boyce Road in the City of Fremont (see **ALTERNATIVES Figure 4**). The parcel consists of 15.89 acres, approximately six acres of which are occupied by the Borden facility. Adjacent land uses are industrial, including the Borden facility, a Cellulite plant, and warehouses.

There are two potential sources of recycled water for the site Alt-3: the South Bay Water Recycling (SBWR) Program and the Alameda County Union Sanitary District (USD) Alvarado Waste Water Treatment Plant (WWTP). The closest connection to the SBWR Program is in Milpitas where the distribution system extends northward on the west side of I-880 to the Alameda County-Santa Clara County border. The distance from the existing distribution system to the site is approximately eight miles. The USD Alvarado WWTP is located in Union City, approximately eight miles from the site. A potable water line adjacent to the site apparently could provide most of the potable water needed for the project. Additional water may be obtainable by drilling new on-site wells.

Sanitary sewer lines are in the immediate vicinity of the site. Waste water disposal would probably require a dedicated blowdown brine line to the San Jose/Santa Clara WPCP (approximately nine miles) or to the Alvarado WWTP (approximately eight miles).

PG&E high pressure natural gas transmission lines are approximately two miles to the northeast. A route for a connecting line would be expected to follow city streets to the site. An overhead or underground electric transmission line would follow existing streets from the site to the existing PG&E Newark Substation approximately one mile away.

ALT-4

Site Alt-4 is northwest of the intersection of Grimmer Boulevard and Warm Springs Boulevard in the City of Fremont (see **ALTERNATIVES Figure 4**). The site consists of two parcels totaling 20.66 acres. The site is flat and vacant. Surrounding land uses are primarily industrial and commercial, including a lumber yard, a truck trailer and railcar storage yard, a large RV storage yard. A huge GM/Toyota car manufacturing plant is approximately one-half mile to the south. Two homes on large lots with orchards are located east of the site, across Old Warm Springs Road.

There are two potential sources of recycled water for the site Alt-4: the South Bay Water Recycling (SBWR) Program and the Alameda County Union Sanitary District (USD) Alvarado Waste Water Treatment Plant (WWTP). The closest connection to the SBWR Program is in Milpitas where the distribution system extends northward on the west side of I-880 to the Alameda County-Santa Clara County border. The

ALTERNATIVES Figure 4
Staff's Alternative Sites Alt-3 and Alt-4

distance from the existing distribution system to the site is approximately seven miles. The USD Alvarado WWTP is located in Union City, approximately 11 miles from the site. A potable water line adjacent to the site apparently could provide most or all of the potable water needed for the project. Additional water may be obtainable by drilling new on-site wells. Sanitary sewer lines are in the immediate vicinity of the site. Waste water disposal would probably require a dedicated blowdown brine line to the San Jose/Santa Clara WPCP (approximately six miles) or to the Alvarado WWTP (approximately 11 miles).

PG&E high pressure natural gas transmission lines are adjacent to the site. An electric transmission line would connect the site to the existing PG&E Newark Substation approximately 2 ½ miles away. The line may need to be underground.

ALT-5

Site Alt-5 is located on a 49.53-acre parcel in rural eastern Alameda County (see **ALTERNATIVES Figure 5**). The site is adjacent to the north side of PG&E's Tesla Substation. The site is currently used for grazing. Surrounding land is also used for grazing. A PG&E high-pressure natural gas transmission line runs through the substation property less than 1,000 feet south of the site. Because the site is adjacent to the existing Tesla substation, the length of the electrical transmission connection would be minimal. Constraints exist regarding water supply and wastewater disposal (see the subsequent discussion of Soil and Water Resources in relation to this site).

ALT-6

Site Alt-6 is located on a 299.1-acre parcel in rural eastern Alameda County (see **ALTERNATIVES Figure 5**). The site is adjacent to the northwest side of PG&E's Tesla Substation. The site is currently grazing land with a wind farm on the western portion. With the exception of the substation, surrounding land is used for grazing. A PG&E high-pressure natural gas transmission line runs through the substation property less than 1,000 feet south of the site. Because the site is adjacent to the existing Tesla substation, the length of the electrical transmission connection would be minimal. Constraints exist regarding water supply and wastewater disposal (see the subsequent discussion of Soil and Water Resources in relation to this site).

COMPARISON OF QUALIFYING ALTERNATIVE SITES TO THE SCREENING CRITERIA

This section compares the six alternative sites that satisfied the screening criteria to the criteria. The reasons why other alternatives did not satisfy the criteria are discussed in Appendix A.

a. Meet most of the basic objectives of the project.

Staff has made the following determinations regarding the extent to which alternative sites are likely to meet the five basic project objectives identified above that are relevant to alternative site selection:

1. Being on-line by the summer peak of 2002.

None of the alternative sites could satisfy this objective, because detailed site investigation and the permit process have not begun on any alternative site.

ALTERNATIVES Figure 5
Staff's Alternative Sites Alt-5 and Alt-6

Development of any of the alternatives would come on-line at least an additional 18 to 30 months after the proposed project because of the time required for site review, application preparation, and regulatory review. This delay is of concern to the California Independent System Operator because of reliability concerns in the San Francisco Bay Area.

2. *Providing Bay Area electric grid reliability benefits.*

Alternative sites Alt-1 through Alt-6 would provide such benefits, to differing degrees⁶. The measures used for comparison of system performance are listed in the left column of **ALTERNATIVES Table 2**. **ALTERNATIVES Table 3** shows the local system effects of the use of alternative sites Alt-1 through Alt-6 compared to the proposed project.

The proposed project and all of the alternatives would provide significant transmission loss reduction that results in direct energy savings benefits. The loss reduction due to MEC compared to the base system is 30 MW for 2002 and 39 MW for 2005. None of the alternatives provide any loss reduction benefits until at least 2004 because of the additional time for site design, permitting and construction. For the study year 2005, loss reductions for Los Esteros (alternative sites Alt-1 or Alt-2) and Newark (alternative sites Alt-3 and Alt-4) are substantially better than MEC, averaging about 30 MW more loss reduction than MEC. Loss savings for Tesla average about 22 MW, somewhat worse (about 17 MW less) than MEC.

For all other performance measures, improved performance implies potential opportunity for reduced future capital and/or operating cost savings. Although staff's analysis indicates changes in relative system performance as measured by changes to overloads, voltage drops, and reactive margin, determination of specific savings due to avoidance of capital spending otherwise needed to meet performance criteria is beyond the scope of staff's analysis.

The analysis reveals that use of site Alt-1, Alt-2, Alt-3, or Alt-4 would be better than or essentially the same as the proposed project for each of the performance measures and somewhat better overall. The greater interconnection costs for those alternative sites would be more than offset by the substantially greater transmission loss reductions.

Alternative sites Alt-5 and Alt-6 are worse or somewhat worse than the proposed project for each of the performance measures, and are somewhat worse overall.

3. *Mitigating transmission congestion into the area.*

To satisfy objective 3, any alternative must be connected to one of following six Pacific Gas & Electric substations or the 230 kilovolt transmission lines

⁶ Alternative sites Alt-1 and Alt-2 also require the approval and construction of PG&E's proposed Los Esteros substation.

ALTERNATIVES Table 2

Comparative Local System Effects: MEC and Alternative Sites Alt-1 through Alt-6

PERFORMANCE MEASURE	MEC	Alt-1 or Alt-2 (Los Esteros Substation)	Alt-3 or Alt-4 (Newark Substation)	Alt-5 or Alt-6 (Tesla Substation)
System Losses	-	Substantially Better	Substantially Better	Somewhat Worse
Outage Related Overloads	-	Somewhat Better	Somewhat Better	Somewhat Worse
Outage Related Voltage Drop	-	Essentially the Same to Somewhat Better	Essentially the Same to Somewhat Better	Worse
VAR Support (Reactive Margin)	-	Essentially the Same	Essentially the Same	Somewhat Worse
RMR	-	Essentially the Same	Essentially the Same	Somewhat Worse
Overall System Performance Impact	-	Somewhat Better	Somewhat Better	Somewhat Worse
Interconnection ⁷ Cost	-	Somewhat Worse	Worse	Somewhat Worse

that connect them: Metcalf, Monta Vista, Jefferson, Newark, Ravenswood, or San Mateo. Sites Alt-1, Alt-2, Alt-3, and Alt-4 satisfy this objective. Sites Alt-5 and Alt-6 do not.

In summary, none of the alternatives meet the first project objective. Four of the six sites (Alt-1, Alt-2, Alt-3, and Alt-4) satisfy project objectives 2 and 3. The other two sites (Alt-5 and Alt-6) satisfy objective 2.

⁷ Cursory level planning estimates of interconnection cost based on linear multipliers for overhead line construction plus termination: MEC = \$340,000; Los Esteros (Alt-1 or Alt-2) = \$840,000; Newark (Alt-3) = \$1,000,000; Newark (Alt-4) = \$2,300,000; Tesla (Alt 5 or Alt-6) = \$850,000.

ALTERNATIVES Table 3

Comparative Transmission System Loss Savings: Study Year 2005 MEC and Alternative Sites Alt-1 through Alt-6

	MEC	Alt-1 or Alt-2 (Los Esteros Substation)	Alt-3 or Alt-4 (Newark Substation)	Alt-5 or Alt-6 (Tesla Substation)
Reduction in System Losses	39 MW	72 MW	67 MW	22 MW
Corresponding Annual Energy Saved	81 GWh	159 GWh	148 GWh	40 GWh
Value of Estimated ⁸ Annual Energy Saved	\$3.8 million	\$7.6 million	\$7.1 million	\$1.9 million
Energy Savings Converted ⁹ to Annual Energy Consumption for Number of Homes	12,000	24,000	22,000	6,000

b. Avoid or substantially lessen one or more of the potential significant effects of the project.

ALTERNATIVES Table 4 shows the potential significant impacts of the proposed project and the six alternative sites. From a screening perspective, the staff determined which of the proposed sites would avoid or substantially lessen the potential significant adverse visual or land use impacts of the Metcalf project. Use of alternative site Alt-3, Alt-4, Alt-5, or Alt-6 would avoid the proposed project's significant unmitigated impact due to the conversion of prime farmland to non-agricultural use. Use of any of alternative sites Alt-1 through Alt-6 would avoid the proposed project's significant unmitigable impacts due to incompatibility with nearby residential land use but sites Alt-1, Alt-2, Alt-3, and Alt-4 would have land use inconsistencies. Alternative sites Alt-3, Alt-4, Alt-5, or Alt-6 would avoid the proposed project's significant unmitigable adverse and cumulative visual impacts.

Although alternative sites Alt-5 and Alt-6 would avoid at least one significant adverse environmental impact that the proposed project would cause, they may have significant adverse biological and water impacts. Sites Alt-1 and Alt-2 would have significant adverse land use impacts due to conversion of prime agriculture land and may have significant visual impacts.

⁸ Conversion factors used: gas cost = \$4/mmbtu, heat rate = 12,000btu/KWh.

⁹ Conversion factor used: 6,800KWh/year energy consumption per home.

c. Satisfy the Feasibility Screening Criteria

1. Site Suitability

Staff generally considered sites 14 acres or larger¹⁰ unless specific circumstances indicated that a smaller site may be sufficient. Five of the alternative sites (Alt-1, Alt-2, Alt-4, Alt-5, and Alt-6) are larger than 14 acres and their shape creates no obstacle to their use. The sixth site (Alt-3) does not meet the criteria because it is approximately ten acres in size. More detailed engineering may make this site suitable.

2. Availability of Infrastructure

Staff limited its search area to a reasonable distance from 230 kV substations and transmission lines. Sites Alt-1 and Alt-2 are located some distance from existing substations but is adjacent to the proposed site of PG&E's 230 kV Los Esteros substation. These alternative sites would be infeasible if the substation is not approved and built. Site Alt-3 is located approximately one mile from PG&E's 230 kV Newark substation. Site Alt-4 is located approximately two and one-half miles from PG&E's Newark substation. Sites Alt-5 and Alt-6 are located adjacent to PG&E's 230 kV Tesla substation.

Major natural gas lines are located in the vicinity of sites Alt-1 through Alt-6. Sites Alt-1, Alt-2, Alt-4, Alt-5, and Alt-6 are located within one-half mile of a major gas transmission line. Site Alt-3 is located approximately two miles from a major gas transmission line.

Staff has identified adequate water supply sources and water disposal infrastructure for sites Alt-1, Alt-2, Alt-3, and Alt-4. Existing water sources may be able to provide for some of the project's water needs at sites Alt-5 and Alt-6. Meeting the remaining water needs may require technically feasible alternative mitigation technology.

3. Availability of the Site

An important consideration in studying alternatives is site availability and site control. Whereas the Calpine/Bechtel has site control over the Metcalf site, they do have site control of any of the alternative sites. In this analysis, staff briefly investigated the availability of the various alternative sites and believes site control may be possible but many factors beyond the control of a potential buyer influence the availability of a specific site. In a previous siting case before the Energy Commission in the mid-90's (or was that the early 90's), an applicant filed an AFC on a site in the San Francisco Bay area in which they had not secured site control. Even after Energy Commission approval (contingent upon securing control of the site), the applicant was not able to secure the site. Consequently that plant was never built.

¹⁰ The alternatives discussion in the application for certification used 14 acres as the minimum site size.

ALTERNATIVES Table 4
Comparison of Proposed Project and Qualifying Alternative Sites in Regard to Impact Significance and Land Use Conformance¹

	PROPOSED SITE	ALT-1	ALT-2	ALT-3	ALT-4	ALT-5	ALT-6
AIR QUALITY	Potentially significant, but expected to be mitigated to less than significant.	Potentially significant, but expected to be mitigated to less than significant.	Potentially significant, but expected to be mitigated to less than significant.	Potentially significant, but expected to be mitigable to less than significant.	Potentially significant, but expected to be mitigable to less than significant.	Potentially significant, but expected to be mitigable to less than significant.	Potentially significant, but expected to be mitigable to less than significant.
BIOLOGICAL RESOURCES	Potentially significant, but expected to be mitigated to less than significant	No potential significant impacts expected	No potential significant impacts expected	Potentially significant, but expected to be mitigable to less than significant	Potentially significant, but expected to be mitigable to less than significant	Potential significant impacts; one may not be mitigable to less than significant	Potential significant impacts; one may not be mitigable to less than significant
CULTURAL RESOURCES	Potentially significant, but expected to be mitigated to less than significant	Potentially significant, but expected to be mitigable to less than significant	Potentially significant, but expected to be mitigable to less than significant	Potentially significant, but expected to be mitigable to less than significant	Potentially significant, but expected to be mitigable to less than significant	Potentially significant, but expected to be mitigable to less than significant	Potentially significant, but expected to be mitigable to less than significant

¹ Except for the proposed project, this analysis is based on a screening or fatal flaw level of review. Additional impacts, conformance issues and mitigating measures may be identified at an AFC or EIR level of detail.

	PROPOSED SITE	ALT-1	ALT-2	ALT-3	ALT-4	ALT-5	ALT-6
GEOLOGICAL AND PALEONTOLOGICAL RESOURCES	No expected significant impacts re: geological hazards, geological resources, paleontological resources; or flooding,	For power plant site, no expected significant impacts re: geological hazards, geological resources, or paleontological resources, or flooding; Unknown potential re: linears, but expected to be mitigable to less than significant	For power plant site, no expected significant impacts re: geological hazards, geological resources, or paleontological resources, or flooding; Unknown potential re: linears, but expected to be mitigable to less than significant	For power plant site, no expected significant impacts re: geological hazards, geological resources, or paleontological resources, or flooding; Unknown potential re: linears, but expected to be mitigable to less than significant	For power plant site, no expected significant impacts re: geological hazards, geological resources, or paleontological resources, or flooding; Unknown potential re: linears, but expected to be mitigable to less than significant	For power plant site, no expected significant impacts re: geological hazards, geological resources, or paleontological resources, or flooding; Unknown potential re: linears, but expected to be mitigable to less than significant	For power plant site, no expected significant impacts re: geological hazards, geological resources, or paleontological resources, or flooding; Unknown potential re: linears, but expected to be mitigable to less than significant
LAND USE	Significant unmitigated adverse impact due to conversion of prime farmland to nonagricultural use Land use incompatibility (visual) Nonconformity with general plan designation, zoning, height limitation, policy plan design guidelines, and policy plan design standards	Significant unmitigated adverse impact due to conversion of prime farmland to nonagricultural use Nonconformity with general plan designation, zoning, and height limitation	Significant unmitigated adverse impact due to conversion of prime farmland to nonagricultural use Nonconformity with general plan designation, zoning, and height limitation	No significant impacts expected Nonconformity with height limitation	No significant impacts expected Nonconformity with height limitation	No significant impacts expected	No significant impacts expected

	PROPOSED SITE	ALT-1	ALT-2	ALT-3	ALT-4	ALT-5	ALT-6
NOISE	Potentially significant, but expected to be mitigated to less than significant	Potentially significant, but expected to be mitigable to less than significant	Potentially significant, but expected to be mitigable to less than significant	Potentially significant, but expected to be mitigable to less than significant	Potentially significant, but expected to be mitigable to less than significant	No significant impacts expected	No significant impacts expected
PUBLIC HEALTH	No significant impacts expected.	No significant impacts expected; any impacts could be mitigated to less than significant.	No significant impacts expected; any impacts could be mitigated to less than significant.	No significant impacts expected; any impacts could be mitigated to less than significant.	No significant impacts expected; any impacts could be mitigated to less than significant.	No significant impacts expected; any impacts could be mitigated to less than significant.	No significant impacts expected; any impacts could be mitigated to less than significant.
SOCIOECONOMIC S	Potential significant adverse impact to emergency services, but expected to be mitigated to less than significant	No significant adverse impacts expected; any impacts could be mitigated to less than significant.	No significant adverse impacts expected; any impacts could be mitigated to less than significant.	No significant adverse impacts expected; any impacts could be mitigated to less than significant.	No significant adverse impacts expected; any impacts could be mitigated to less than significant.	No significant adverse impacts expected; any impacts could be mitigated to less than significant.	No significant adverse impacts expected; any impacts could be mitigated to less than significant.
SOIL AND WATER RESOURCES	Salinity impact to SBWR expected to be mitigated to less than significant. Benefit of reduced effluent discharge to South Bay	Same as the proposed project	Same as the proposed project	Same as the proposed project	Same as the proposed project	Potential significant impact to water supply; may be mitigable with dry cooling, but impacts to potable water supply may remain; Potential significant impact of discharge water; could be mitigated with evaporation ponds or zero discharge system	Potential significant impact to water supply; may be mitigable with dry cooling, but impacts to potable water supply may remain; Potential significant impact of discharge water; could be mitigated with evaporation ponds or zero discharge system

	PROPOSED SITE	ALT-1	ALT-2	ALT-3	ALT-4	ALT-5	ALT-6
TRAFFIC AND TRANSPORTATION	Hazard at railroad crossing; expected to be mitigated to less than significant	Potential traffic delays; mitigable to less than significant	Potential traffic delays; mitigable to less than significant	No significant impacts expected	Potential traffic delays; mitigable to less than significant	No significant impacts expected	No significant impacts expected
VISUAL RESOURCES	Significant unmitigable adverse impact to nearby residences and to visual quality and character of North Coyote Valley; would contribute to a significant cumulative impact	Would contribute to a significant cumulative impact	Would contribute to a significant cumulative impact	No significant impacts expected	No significant impacts expected	No significant impacts expected	No significant impacts expected
WASTE MANAGEMENT	No significant impacts expected	No significant impacts expected	No significant impacts expected	No significant impacts expected	No significant impacts expected	No significant impacts expected	No significant impacts expected

Evidence available when the analysis began indicated that alternative sites Alt-1 through Alt-6 were potentially available. USDataport has recently applied for a planned development permit from the City of San Jose for a data center and telecommunications center that would include sites Alt-1 and Alt-2 (USDataport 2000b; see **ALTERNATIVES Figure 6**). The project as proposed would also encompass the property that PG&E has proposed as the site for its planned Los Esteros Substation (PG&E 1999). USDataport has asked the California Public Utilities Commission (CPUC), which is processing PG&E's application, to require PG&E to change the substation site to buffer lands of the San Jose – Santa Clara Waste Water Treatment Plant just northwest of PG&E's proposed substation location (USDataport 2000a). USDataport's request has caused the CPUC to recirculate the Draft Environmental Impact Report for the PG&E project. A decision on the substation project is still expected in January 2001. The City of San Jose is processing USDataport's planned development application. A draft EIR is being prepared, and a decision is expected approximately in January 2001 (Crabtree 2000).

Although development of the USDataport project as proposed would preclude use of sites Alt-1 and Alt-2, the project could either be denied or revised to exclude either Alt-1 or Alt-2. In addition, the City of San Jose owns a substantial amount of land just west of the sites that is buffer land for the San Jose – Santa Clara Waste Water Treatment Plant. (Scheips 2000). City planning staff has stated that such land could be considered as a substitute for sites Alt-1 and Alt-2 (Prevetti 2000). The land is designated for Public/Quasi-Public, the same designation that the proposed project is trying to obtain for its site.

The USDataport project also includes a switchyard and a 49 MW power plant. The plant, which would be owned and operated by Calpine Seapower (a subsidiary of Calpine), would provide USDataport with a portion of their electric needs (the project requires a total of 180 MW) and chilled water. Both the switchyard and the power plant would be located on a 20-acre portion of WWTP buffer land immediately west of PG&E's proposed site for the Los Esteros Substation, southwest of site Alt-1, and northwest of site Alt-2 (USDataport 2000b). A draft EIR on the USDataport project is expected to be published this Fall, with hearings on the proposal to be held possibly by the end of the year (Crabtree 2000).

In regard to site Alt-4, in a response to a staff data request (Calpine/Bechtel 2000, Response to Data Requests 3-207, 3-208, and 3-209, p.11), the applicant discussed what they called a "fatal flaw" for site Alt-4 concerning a deed restriction. The applicant stated that this restriction appears "to prevent the sale or lease of this land to any facility which would treat, store, or dispose of hazardous waste such as that normally encountered at a MEC-type of facility." Energy Commission staff contacted the real estate department for the former owner, General Motors Corporation. Their representative stated that the section of the deed regarding restrictions related to hazardous substances, hazardous waste, and toxic substances is used in virtually all of

GM's deeds. He said that in his opinion the language does not preclude storage of hazardous substances such as those common for power plant use. He said that GM sells the majority of its property to industrial users, and that GM does not follow-up on what the new owners are storing on the property, and that it is assumed, if they are an industrial user, that some hazardous substances will be required to be stored on site for use (Schwartz, C. 2000).

Site Alt-4 is one of three sites evaluated in a draft environmental impact report as a potential transfer station, one of several options for dealing with waste by the City of Fremont (Fremont 2000). The City of Fremont has not made a decision regarding which option to pursue. The staff has not contacted the City of Fremont regarding the availability of this site.

4. General Plan and Zoning Consistency

Alternative sites Alt-3, Alt-4, Alt-5, and Alt-6 are consistent with existing general plan designations and zoning districts. Sites Alt-1 and Alt-2 would, similar to the proposed project, require a general plan amendment and zoning change. The general plan designation for sites Alt-1 and Alt-2 (light industrial) is as close or closer to the designation appropriate for a power plant (Public/Quasi-Public) than is that of the proposed project (campus industrial), so it is not reasonable to eliminate those sites for violating this criterion. Alt-3 and Alt-4 would not comply with the City of Fremont's height restriction in the zoning ordinance. Staff did not use compliance with particular standards, such as height restrictions and setbacks, as a screening criterion.

5. Not located adjacent to moderate or high density residential areas or to sensitive receptors (such as schools and hospitals) or to recreation areas.

All six alternative sites satisfy this criterion.

ENVIRONMENTAL EVALUATION OF ALTERNATIVE SITES

The land use and visual impacts that staff found to be significant and unmitigated are described in a previous section. For more information on these topics, refer to the **LAND USE** and **VISUAL RESOURCES** sections of the Final Staff Assessment.

ALTERNATIVE SITES ALT-1 THROUGH ALT-6

AIR QUALITY

ANALYSIS

This analysis discusses the implications of locating the proposed Metcalf Energy Center at various alternative sites and compares them in general to the proposed site with respect to air quality. Project-related emissions are generated during facility construction and operation. If not mitigated, emissions from the Metcalf project would add to existing ozone and PM10 violations and produce significant

adverse impacts. However, the project's emissions will be fully mitigated by Calpine/Bechtel providing offsets and implementing mitigation measures.

The following is a basic comparison of alternative sites. Air emission dispersion modeling for each site may be necessary to accurately predict the extent of differences in public exposure to project emissions.

The quantity of air emissions from the operation of the facility would be the same at any site, because they are a function of the project design and operation.

All of the six alternative sites are located in the same Air District (Bay Area Air Quality Management District) as the proposed project. Therefore, all applicable rules to the proposed site would apply to all alternative sites. The mitigation/offsets requirements for the New Source Review regulations, BACT analysis, and permit conditions will be the same for all six sites and the proposed site.

The topography is different between the proposed site location and sites 1 to 4. Alternative sites 1 to 4 are located in relatively flatter areas that may help to better disperse the project emissions. However, the predominant wind direction is from the northwest, the same as for the proposed location. Therefore, the impact of locating the project at any of the four sites would add to the air quality violations in the San Jose area. Sites Alt-5 and Alt-6 are closer to hills, similar to the proposed site.

Sites Alt-1, 2, 3, and 4 are all within about one-half mile of residences, as is the proposed Metcalf site. This suggests that the exposure to the maximum impacts at these sites would be similar to the proposed site. Sites Alt-5 and 6 are within about one mile of residences, however, the impacts are not clear compared to the proposed site. Impacts are not necessarily less for Alt. 5 and 6 even if residents are farther from the source.

Sites Alt-1, 2, 3, and 4 are located relatively close to industrial areas similar to the proposed project location, which can make potential offset sources available to mitigate the project emissions. On the other hand, Alt-5 and Alt-6 are farther from offset sources. However, for the Air District, as long as the offsets are obtained from the District's air basin, the Air District's regulations are satisfied. Therefore, the offsets issue is essentially the same for all of the sites.

SUMMARY

Some impacts may depend on site-specific differences in the locations of sensitive receptors, although dispersion modeling would be necessary to confirm this for each alternative site. However, staff expects that all impacts could be mitigated to a less than significant level at any of the sites.

BIOLOGICAL RESOURCES

ANALYSIS

Staff conducted a preliminary analysis of biological resources potentially present at six alternative sites for the MEC project. This analysis is based on a cursory review using aerial photographs and the California Natural Diversity Data Base. Staff visited the sites but did not conduct detailed surveys. Staff then compared the alternative sites to the proposed site.

The Proposed Project

The proposed MEC project may have indirect and cumulative impacts to biological resources from NOx deposition on serpentine habitats that staff, in consultation with USFWS, has concluded can be fully mitigated.

Alt-1 and Alt-2

Site Alt-1 is disked agricultural land. Site Alt-2 consists of agricultural lands and structures, such as greenhouses and farms. These sites are about two miles southeast of the San Francisco Bay National Wildlife Refuge (Alviso Unit) and about 1000 feet west of Coyote Creek.

Sites Alt-1 and Alt-2 are adjacent to lands identified for PG&E's proposed Los Esteros Substation and have existing gas lines running through the properties. Water supply and discharge pipelines would travel along existing roads to the San Jose – Santa Clara WWTP.

The sites proper and linear facilities are not expected to have any direct effect on listed plant or wildlife species. However, wetlands located on lands west of the site would need to be avoided.

The area is approximately four miles directly west of serpentine soils in the Diablo Range. Therefore, use of either site Alt-1 or Alt-2 could cause the indirect impact of NOx deposition on serpentine habitat, similar to the proposed project.

Alt-3 and Alt-4

Site Alt-3 consists of grassland, an evaporation pond, and shrubs which appear to have been planted as a visual screen around the pond. A transmission line would run about one mile along existing roads to the Newark Substation and would be placed either aboveground or underground. The 1.5-mile gas line would follow a transmission line easement along roads, including 0.5 miles through a residential area. Water lines would follow roads with the exception of about 0.5 miles, which would run through agricultural land.

Site Alt-4 has been disked and supports grasses that may be periodically harvested. The transmission line would either use existing towers of a 115 kV line or run underground for 2.5 miles. Existing gas lines are within several hundred feet of the site. Pipelines for supply water (7 to 11 miles) and wastewater (6 to 11 miles) would follow existing roads.

Because the sites are disturbed, the linear facilities short and along existing roads, and the areas are not located near serpentine habitats, no direct or indirect significant impacts are expected.

Alt-5 and Alt-6

Sites Alt-5 and Alt-6 are located in rural eastern Alameda County. Development in the area includes wind generation and the Tesla Substation and associated transmission lines. These sites support foothill grassland and likely have vernal pools and/or seasonal wetlands. Such wetlands could support listed fairy and tadpole shrimp. Creeks could support California red-legged frogs and foothill yellow-legged frogs. Listed plants including large-flowered fiddleneck could be present. These sites are also within the range of, and support habitat for, San Joaquin kit fox and western burrowing owl. Several protected resident and migratory raptor species use this area for foraging.

The length of the gas line and transmission line would be minimal. The water source may be the California Aqueduct or the Delta-Mendota Canal which could result in Delta smelt, Sacramento splittail, and other fisheries issues.

Use of site Alt-5 or Alt-6 could result in impacts to listed species. Many of these impacts may be mitigable to less than significant levels. Mitigation of the loss of San Joaquin kit fox habitat would require off-site compensation. However, in the event kit fox are observed, the impacts may be significant and unmitigable due to rare occurrences in this portion of their range. Additionally, it would not be preferable to bring development to this relatively undeveloped site. Use of site Alt-5 or Alt-6 would not affect serpentine habitat.

SUMMARY

Use of sites Alt-1 and Alt-2 has the potential for significant biological impacts but those impacts are expected to be mitigable to a less than significant level.

Use of sites Alt-3 and Alt-4 would have no direct or indirect significant impacts to biological resources.

Sites 5 and 6 support habitat for several listed species. If San Joaquin kit fox are found to occur at Sites 5 or 6, use of the site for the power plant could cause a significant impact that may be unmitigable. A complete and accurate determination of potential impacts to listed species would require field surveys completed at the appropriate time(s) of year.

CULTURAL RESOURCES

INTRODUCTION

Unknown and previously unrecorded cultural resources may be present at or below the surface at the proposed and the alternative power plant sites and/or along the routes presented for the linear facilities needed to supply or service the project

sites. Construction of a power plant and linear facilities would involve clearing of the ground surface and excavation and trenching below the surface. Any cultural resources present could be damaged or destroyed during such construction activities. A number of cultural resource mitigation measures are typically included with any permits granted for project construction in particularly sensitive resource areas. Frequently these measures include monitoring of construction activities by qualified cultural resource professionals. The Energy Commission typically adopts such measures in its certification of a project and then oversees project construction and operation to ensure that these measures are implemented so that potential impacts to cultural resources will be mitigated to a less than significant level.

ANALYSIS

The Proposed Project

The applicant has had a record search performed and has had the proposed project site and the routes for the proposed linear facilities surveyed. The record search and surveys show many cultural resources in the vicinity of the proposed project. This indicates that other as yet undiscovered cultural resources may be present, particularly beneath the present-day ground surface. Both prehistoric and historic resources have been recorded in the vicinity of the project.

Use of each alternative site would necessitate the use of several different routes for the linear facilities needed to serve each project site. Project-related linear facilities include a natural gas supply pipeline, a water supply pipeline, a potable water supply pipeline, a wastewater disposal pipeline, and an electric transmission line. For some of the linear routes, there is more than one potential source of supply, leading to alternative routes for the service being carried. Refer to the Description of the Alternatives for maps showing the various routes.

Alternative Site Evaluation Approach

This cultural resource assessment of alternative sites focuses on the topographic relationship between the alternative site and natural features and resources, the proximity of the alternative site to the location of known archaeological resources, and the type and extent of these known resources.

Record Search for Alternative Sites and Comparison of Resource Potential

Staff requested an archaeological record search by the Northwest Information Center [part of the California Historic Resource Information System (CHRIS)] at Sonoma State University. The summary report on the record search indicates that over one hundred archaeological studies have been carried out within one-quarter mile of the alternative project areas. Within the areas surveyed, a total of 52 archaeological finds (sites, structures, and isolates) have been found within one quarter-mile of the alternate project areas identified by staff. Generally, areas located near the margins of the marshes along the southern reaches of the San Francisco Bay, have been the subjected to more studies and contain the majority of the known resources. Areas to the east, into the hills of the coastal range, have

been less studied and less is known about the resource potential (NW CHRIS 2000a).

The CHRIS considers the coastal portions of the project alternatives study area to be sensitive for prehistoric material even when there is no surface component visible. Many of the sites in the coastal areas have been buried under alluvium deposited by storm tidal patterns or during seasonal flooding. Southern Alameda County and northern Santa Clara County, in the vicinity of the San Francisco Bay, are rich in useable land and resources and they have a long pattern of prehistoric and historic human use. Numerous already-known cultural resources have been found both on the surface and beneath the surface. The nearness of the bay; the presence of the rivers, streams and creeks, marshes and wetlands; the form of sheltering hills and valleys; and the abundance and variety of necessary resources all indicate that there is a potential that prehistoric and historic resources may be encountered and disturbed by the proposed project, as well as use of alternative sites 1, 2, 3, and 4, and the routes for their linear facilities.

The topography and environmental conditions on the eastern side of the coastal hills, where sites 5 and 6 are located, led the CHRIS to describe the potential for cultural resources to be present as "intermittent" and to generally consider the area to be less sensitive for cultural resources than the area containing alternative sites Alt-1, 2, 3, and 4.

Alt-1

The Alternative 1 site has not been surveyed but 17 surveys have been conducted within one-half mile of the site. The CHRIS considers the site vicinity to be sensitive for buried prehistoric remains but to have a low sensitivity for historic resources. The routes of the linear facilities may be sensitive for both prehistoric and historic resources. The presence of six known prehistoric sites, including four with burials, within one-half mile of the power plant site, indicates that this alternative has a greater potential for impacts to cultural resources than the proposed project or alternative sites Alt-5 and Alt-6 and their linear routes.

Alt-2

The Alternative 2 site has been surveyed and 17 surveys have been conducted within one-half mile of the site. The CHRIS considers the site vicinity to be sensitive for buried prehistoric remains but to have a low sensitivity for historic resources. The routes of the linear facilities may be sensitive for both prehistoric and historic resources. The presence of six known prehistoric sites, including four with burials, within one-half mile of the power plant site, indicates that this alternative has a greater potential for impacts to cultural resources than the proposed project or alternative sites Alt-5 and Alt-6 and their linear routes.

Alt-3

The Alt-3 site area has previously been surveyed and numerous surveys have been conducted in the vicinity of the site and along the potential linear routes. The CHRIS considers the site area to be sensitive for buried prehistoric remains but to

have a low sensitivity for historic resources. The routes of the linear facilities may be sensitive for both prehistoric and historic resources. The presence of several recorded prehistoric sites, including burials, along a section of the eight-mile route for the recycled water supply line and the wastewater disposal line, plus the greater length of the transmission lines indicate that this alternative has greater potential for impacts to cultural resources than the proposed project or sites Alt-5 and Alt-6 and their linear routes.

Alt-4

The Alt-4 site area has not been previously surveyed but numerous surveys have been conducted in the vicinity of the site and along the potential linear routes. Although no significant cultural resources were found, the CHRIS considers the site area to be sensitive for buried prehistoric remains but to have low sensitivity for historic resources. The routes of the linear facilities may be sensitive for both prehistoric and historic resources. The presence of several recorded prehistoric sites, including burials, along a section of the eleven-mile route for the recycled water supply line and the wastewater disposal line, plus the greater length of the transmission lines indicate that this alternative has greater potential for impacts to cultural resources than the proposed project or sites Alt-5 and Alt-6 and their linear routes.

Alt-5

The Alternative 5 site has not been previously surveyed but seven surveys have been conducted on lands adjoining the parcel to the west and north. Three historic resource sites were recorded during these surveys, two of them located less than 1,000 feet from this alternative site. Based on the previous surveys, the location, and other environmental factors, the CHRIS considers the area around site Alt-5 to have a low potential for prehistoric resources. However, the CHRIS considers the site area to have a high sensitivity for historic resources.

A transmission line would be very short because the site is adjacent to the Tesla substation. Similarly, a gas line would be very short because a gas line runs through the substation property. Information on the potential route for a water/wastewater pipeline from the Alt-5 site to the treatment facility in Tracy was unavailable. A record search has not been completed for the water and wastewater lines in San Joaquin County and no information was available on known cultural resources along these routes. Generally, because Alt-5 has a lower potential for prehistoric resources than the proposed project, it has a lower overall potential for impacts to cultural resources than the proposed project and Alternatives Alt-1, 2, 3, and 4.

Alt-6

The Alt-6 site has previously been surveyed and no significant cultural resources were found. The area around the site has been the subject of seven previous surveys and three historic resource sites have been recorded within one-quarter mile of this alternative site. Based on the previous surveys, the location, and other environmental factors, the CHRIS considers the area around site Alt-6 to have a low potential for prehistoric and historic resources.

A transmission line would be very short because the site is adjacent to the Tesla substation. Similarly, a gas line would be very short because a gas line runs through the substation property. Information on the potential route for a water/wastewater pipeline from the Alt-5 site to the treatment facility in Tracy was unavailable. A record search has not been completed for the water and wastewater lines in San Joaquin County and no information was available on known cultural resources along these routes. Generally, Alt-6 has a lower potential for impacts to cultural resources than the proposed project and Alternatives Alt-1, 2, 3, 4, and 5.

SUMMARY

Project development at any of the alternative project locations, as well as the proposed location, has the potential to encounter previously unknown cultural resources and cause significant impacts. However, the potential for such impacts differs between the locations. The locations for Alt-1, 2, 3, and 4 have more potential than the proposed project. The locations for site Alt-5 have less potential than the proposed project or the locations for Alt-1, 2, 3, or 4. The locations for Alt-6 have less potential than the proposed project or the locations for Alt-1, 2, 3, 4, or 5. Although the extent and nature of the unknown resources and impacts on them can only be imprecisely predicted in advance of construction-related ground disturbance, timely implementation of appropriate monitoring and mitigation measures would be likely to reduce impacts to less than significant levels. Therefore, after implementation of mitigation, the impact to cultural resources is expected to be less than significant for the proposed project and all of the six alternative locations.

GEOLOGICAL AND PALEONTOLOGICAL RESOURCES

ANALYSIS

For the purposes of this analysis, the elements of the project located within the boundaries of the primary site location are considered to be the same for all six alternative sites.

Alt-1

The site is located on fluvial (stream bed) deposits at the outer edge of an alluvial fan. The fluvial deposit is made up of sands, silt and clay. The depth to ground water is approximately 5 to 10 feet. The type of foundation for the site would be dependent upon the ability of the fluvium and underlying earth units to support the facilities' structures. The foundation type could vary significantly in cost depending upon whether pile or mat foundations are used or a combination of piles and mat foundations are used. The area is subject to very strong shaking from an earthquake on either the Hayward, the Calaveras or the San Andreas faults. The potential for liquefaction at the site is considered to be moderate (Helley 1979). No faults are known to cross the site. However, the Silver Creek fault trace is located approximately 3,900 feet southwest of the southwestern corner of the site. An unnamed fault is located approximately 600 east of the southeastern corner of the site. Neither the Silver Creek nor the unnamed fault are considered to be active

faults. The closest active fault to the site is the Hayward fault, which is located approximately 3.5 miles east of the site. Due to the low amount of relief (approximately three feet) at the site, the potential for landsliding is considered to be insignificant.

Site Alt-1 is located approximately 800 feet west of Coyote Creek. The western portion of the site is designated as an area of minimal flooding (Zone C) on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map. The eastern portion of the site is designated as within the 100 year flood zone with an undetermined 100 year flood zone elevation (Zone A) on the FEMA map, but the relatively flat terrain of the site indicates that the 100 year flood depth would not be substantial. No permanent surface water bodies exist on the site.

No significant paleontological resource locations and no geological resources are known to exist at the site.

Alt-2

Site Alt-2 is located on fluvial (stream bed) deposits at the outer edge of an alluvial fan. The fluvial deposit is made up of sands, silt and clay. The depth to ground water is approximately 10 feet. The type of foundation for the site would be dependent upon the ability of the fluvium and underlying earth units to support the facilities' structures. The foundation type could vary significantly in cost, depending upon whether pile or mat foundations are used or a combination of piles and mat foundations are used. The area is subject to very strong shaking from an earthquake on either the Hayward, the Calaveras or the San Andreas faults. The potential for liquefaction at the site is considered to be moderate (Helley 1979). No faults are known to cross the site. However, the Silver Creek fault trace is located approximately 3,200 feet west of the southwestern corner of the parcel. An unnamed fault is located approximately 1,000 east of the southeastern corner of the parcel. The closest active fault to the site is the Hayward fault, which is located approximately 3.5 miles east of the site. Due to the low amount of relief (approximately three feet) at the site, the potential for landsliding is considered to be insignificant.

The site is located approximately 1,200 feet west of Coyote Creek. The western portion of the site is designated as an area of minimal flooding (Zone C) on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map. The eastern portion of the site is designated as within the 100 year flood zone with an undetermined 100 year flood zone elevation (Zone A) on the FEMA map, but the relatively flat terrain of the site indicates that the 100 year flood depth would not be substantial. No permanent surface water bodies exist on the site.

No significant paleontological resource locations and no geological resources are known to exist at the site.

Alt-3

Site Alt-3 is located on alluvium. The depth to ground water is approximately 5 to 10 feet. The type of foundation for the site would be dependent upon the ability of

the fluvium and underlying earth units to support the facilities' structures. The foundation type could vary significantly in cost, depending upon whether pile or mat foundations are used or a combination of piles and mat foundations are used. The area is subject to very strong shaking from an earthquake on either the Hayward, the Calaveras or the San Andreas faults. The potential for liquefaction at the site is considered to be moderate (Helley 1979). There are no known faults that cross the site; however, the Silver Creek fault is located approximately 1 mile to the west. The closest active fault is the Hayward fault, which is located approximately 4.5 miles to the east. Due to the low amount of relief at the site, the potential for landsliding is considered to be insignificant.

Site Alt-1 is located approximately 800 feet west of Coyote Creek. The western portion of the site is designated as an area of minimal flooding (Zone C) on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map. The eastern portion of the site is designated as within the 100 year flood zone with an undetermined 100 year flood zone elevation (Zone A) on the FEMA map, but the relatively flat terrain of the site indicates that the 100 year flood depth would not be substantial.

FEMA maps show the portion of site Alt-3 along the eastern edge of the parcel as "A0" (areas where the 100 year flood average depth is between 1 and three feet) and the rest of the parcel as "C" (areas of minimal flooding). No permanent surface water bodies exist on the site.

No significant paleontological resource locations and no geological resources are known to exist at the site.

Alt-4

Site Alt-5 is located on alluvium. The depth to ground water is approximately 5 to 10 feet. The type of foundation for the site would be dependent upon the ability of the fluvium and underlying earth units to support the facilities' structures. The foundation type could vary significantly in cost, depending upon whether pile or mat foundations are used or a combination of piles and mat foundations are used. The area is subject to very strong shaking from an earthquake on either the Hayward, the Calaveras or the San Andreas faults. The potential for liquefaction at the site is considered to be moderate (Helley 1979). No known faults cross the site. The closest active fault to the site is the Hayward fault, approximately 2.5 miles to the east. The area is subject to very strong shaking from an earthquake on either the Hayward, the Calaveras or the San Andreas faults. Due to the low amount of relief at the site the potential for landsliding is considered to be insignificant. No significant paleontological resource locations and no geological resources are known to exist at the site.

The site is located in flood zone "C" (an are of minimal flooding). No permanent surface water bodies exist on the parcel.

No significant paleontological resource locations and no geological resources are known to exist at the site.

Alt-5

Surface geology of site Alt-5 is made up of mainly Quaternary Alluvium in valley bottoms and Miocene age marine sandstone of the Neroly formation. Locally, the Neroly formation sandstone dips 5 degrees to the east. The depth to ground water is unknown. The type of foundation for the site would be dependent upon the ability of the fluvium and underlying earth units to support the facilities' structures. The foundation type could vary significantly in cost, depending upon whether pile or mat foundations are used or a combination of piles and mat foundations are used. No significant landslides are known to exist on or immediately adjacent to the site. The potential for landslides at the site is considered to be low due to the shallow dip of the sandstone and the lack of existing landslides.

The Midway fault trace projection crosses the site under alluvium. The Midway fault is not considered active but has been documented to displace Pleistocene age strata. This indicates that, depending upon placement of the power plant on the parcel, fault rupture is a significant consideration in evaluating this site. The Greenville fault, located approximately 4.8 miles west of the parcel, would be considered the fault associated with the design earthquake from strong ground shaking, because it is active and is capable of generating a much larger earthquake than the Midway fault.

The site is located in flood zone "C." No permanent surface water bodies exist on the parcel.

No significant paleontological resource locations and no geological resources are known to exist at the site.

Alt-6

Site Alt-6 is located on Miocene age marine sandstone of the Neroly formation, an unnamed tan colored sandstone of Miocene age and Quaternary Alluvium. Locally, the sandstone dips from 5 to 17 degrees to the east or northeast. Valley bottoms are covered with Quaternary Alluvium. The depth to ground water is unknown. The type of foundation for the site would be dependent upon the ability of the fluvium and underlying earth units to support the facilities' structures. The foundation type could vary significantly in cost, depending upon whether pile or mat foundations are used or a combination of piles and mat foundations are used. Since the majority of this site is located on sandstone, for discussion purposes a mat foundation for larger facilities may be the first choice for this site, should site specific conditions allow it. No significant landslides are known to exist on or immediately adjacent to the parcel. The potential for landslides at the site is considered to be low due to the shallow dip of the sandstone and the lack of existing landslides. The closest known faults to the site are an unnamed fault within 0.5 miles southwest of the southwestern western limits of the parcel, and the Midway fault, which is located approximately 400 feet east of the northeastern corner of site. The Midway fault is not considered active but has been documented to displace Pleistocene age strata. The Greenville fault is located approximately 4.3 miles west of the parcel and is considered the fault associated with the design earthquake from strong ground shaking, because it is active and is capable of generating a much larger earthquake

than the Midway fault. The footprint for the primary MEC site location is not crossed by known faults, therefore surface rupture due to faulting is considered unlikely.

The site is located in flood zone "C," an area of minimal flooding. No permanent surface water bodies exist on the parcel.

No significant paleontological resource locations and no geological resources are known to exist at the site; however, Diblee (Diblee 1980) indicated that a tan unnamed Miocene age sandstone outcrops in the southwestern corner of the parcel. This sandstone is indicated in the legend of Diblee's map to be of a marine origin and fossiliferous.

SUMMARY

Neither the proposed project nor any of the six alternative sites are expected to cause significant impacts in regard to geology, paleontology, and hydrology.

LAND USE

ANALYSIS

Alt-1

Site Alt-1 is located in an unincorporated area of Santa Clara County but within the City of San Jose's Urban Service Area. Site Alt-1 consists of the northwest 13 acres of a 66.46-acre parcel. The site is currently in agricultural use and designated as Prime Farmland on the 1998 Important Farmland Map for Santa Clara County compiled by the California Resources Agency, Department of Conservation (CDC 1999a). The remainder of the parcel is in agricultural use and contains two small farmhouses located about 2,200 feet and 2,450 feet from site Alt-1 in the southeast portion of the 66.46-acre parcel. Site Alt-1 is designated Light Industrial on the City of San Jose General Plan Land Use Diagram.

The San Jose/Santa Clara Waste Water Treatment Plant is located to the northwest of site Alt-1. WWTP buffer lands and future expansion areas are located immediately adjacent to site Alt-1 to the north, northwest, west, and southwest (San Jose 1998). The WWTP and buffer lands are designated Public/Quasi-Public on the General Plan Land Use Diagram. The buffer lands located immediately to the west of site Alt-1 appear to be used for agriculture. Land currently in agricultural production and planned for light industrial uses lies immediately to the east. About 1,150 feet east of site Alt-1 and east of Coyote Creek in the City of Milpitas is undeveloped land planned for residential, commercial, and research and development/office uses (PG&E 1998).

Sensitive land uses in the vicinity of site Alt-1 include buildings on the parcel to the south that house residents engaged in agricultural work and a residential trailer park located about 0.5 mile to the southwest across Highway 237. Other nearby sensitive land uses are residential neighborhoods located about 0.75 mile to the

southwest, about 1 mile to the east across Interstate 880 in the City of Milpitas, and about 1.5 miles to the west in the community of Alviso.

Comparison to the Proposed Project

The Light Industrial General Plan designation is intended for a wide variety of industrial uses, excluding uses with unmitigated hazardous or nuisance effects (San Jose 1994). A power plant would not conform to the General Plan designation for Site Alt-1, similar to the proposed site. City Planning staff told Calpine/Bechtel that a power plant at site Alt-1 would require a General Plan amendment to Public/Quasi-Public.

Site Alt-1 is located within the area covered by the Alviso Master Plan. The Master Plan sets forth principles for guiding the selection of appropriate land uses in the Alviso area (SJ 1998). These principles include:

- New and existing land uses should be carefully integrated throughout the Alviso planning area (No. 1).
- New land uses should provide needed facilities and services that would complement the existing community (No. 2).
- New land uses should not overwhelm, overpower, or reduce the “neighborly” character of the existing community (No. 3).
- New land uses should be of an appropriate type, size, and scale and located to connect the existing activities in a friendly, logical, and cohesive manner (No. 4).
- Land uses of large size, scale, and intensity could be considered for the lands outside of the village area and closer to First Street and Route 237 (No. 8).
- Undeveloped lands that are part of the Water Pollution Control Plant buffer lands should contain Plant-related, public land uses which effectively separates Plant activities from private, urban uses (No. 10).

Although not a use specifically identified by the Alviso Master Plan, a power plant at site Alt-1 appears to be consistent with many of the plan’s guiding principles. A substantial portion of the Alviso Master Plan area is devoted to the existing WWTP and buffer lands and expansion areas. All of the WWTP properties are designated Public/Quasi-Public, which is the General Plan designation appropriate for a power plant at site Alt-1. Site Alt-1 is located immediately adjacent to existing WWTP activities occurring to the north. Buffer lands and expansion areas lie immediately to the west of site Alt-1. Thus, staff’s assessment is that a power plant at site Alt-1 would be consistent with the Master Plan guiding principles to carefully integrate new uses within the Alviso planning area (No. 1) and to locate land uses of large size and scale closer to Highway 237 and away from the residential community of Alviso (No. 3 and 8). A power plant would be compatible with the intended use of the WWTP buffer lands and expansion areas. It would be similar in character to a water treatment plant and would not introduce a significant population in close proximity to existing and future treatment plant activities (No. 10). A power plant would be a customer for reclaimed water. It would help to reduce the discharge of wastewater to San Francisco Bay, thereby providing a needed service to the WWTP (No 2).

The Alviso Master Plan includes development guidelines and standards for areas designated for Light Industrial, Industrial Park, and Combined Industrial/Commercial use. The Alviso Master Plan also states that for most locations the City's Industrial Design Guidelines provide appropriate direction for Alviso in regard to setbacks. The development standards contained in the Alviso Master Plan and the City's Industrial Design Guidelines are not as restrictive as those in the North Coyote Valley Campus Industrial Area Master Development Plan. Similar to the proposed project, there are no "off the shelf" development standards for a power plant, which requires a Public/Quasi-Public designation, at site Alt-1. Appropriate standards would be based in part on the Alviso Master Plan and the Industrial Design Guidelines. A power plant at site Alt-1 would likely be able to meet these standards, and thus avoid the inconsistencies with development guidelines and standards that the proposed project would have. The General Plan height restriction of 45 feet for Light Industrial uses applies to site Alt-1. However, the general plan designation of Public/Quasi-Public, required for a power plant on the site, has a height limit of 95 feet. An exemption process exists to allow additional height.

Comparison to the Proposed Project

Similar to the proposed project, a power plant at site Alt-1 would not disrupt or divide the physical arrangement of an established community since land in the immediate vicinity is either undeveloped or used for agriculture and a few residences.

Since a power plant at site Alt-1 would be adjacent to the PG&E's proposed Los Esteros Substation, an electrical interconnection line would not disrupt or divide the physical arrangement of an established community. This is similar to the proposed project, which involves a short interconnection line traversing undeveloped grazing land between the MEC site and an existing transmission line tower on Tulare Hill.

According to the CEQA Guidelines, a project would have a significant effect on agriculture if it "converts Prime Farmland, Unique Farmland, or Farmland of Statewide Importance, as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use." Similar to the proposed project, development at site Alt-1 would have a significant and adverse impact on agriculture since it would convert 13 acres of Prime Farmland to non-agricultural use.

Staff does not expect that a power plant at site Alt-1 would cause significant land use incompatibilities, such as unmitigated noise, public health, traffic, or visual impacts. Therefore, use of site Alt-1 would avoid the land use incompatibility impacts of the proposed project in regard to significant and unmitigable visual impacts. Construction of PG&E's Los Esteros Substation is a prerequisite for use of site Alt-1. The substation would displace the closest residences to site Alt-1. The nearest remaining residences (located on site Alt-2) would be about 1,300 feet from site Alt-1, which is approximately the same distance to the nearest residence as the proposed project. Therefore, like the proposed project, it would be feasible to mitigate any adverse noise impacts on these residences to an insignificant level.

Alt-2

Site Alt-2 is located in an unincorporated area of Santa Clara County but within the City of San Jose's Urban Service Area. Site Alt-2 consists of the southern 30 acres of a 54.6-acre parcel. Greenhouses, agricultural facilities, and three buildings that house residents engaged in agricultural work currently occupy the entire parcel. The site is classified as Prime Farmland on the 1998 Important Farmland Map for Santa Clara County (CDC 1999a). Site Alt-2 is designated Light Industrial on the City of San Jose General Plan Land Use Diagram.

Nearby land uses include vacant land planned for Public/Quasi-Public uses to the west (WWTP buffer lands), and land currently used for agriculture and planned for light industrial uses to the east. About 1,500 feet east of site Alt-2 and east of Coyote Creek in the City of Milpitas is undeveloped land planned for residential, commercial; and research and development/office uses.

Sensitive land uses in the vicinity of site Alt-2 include two farmhouses located about 430 feet and 980 feet to the east, and a residential trailer park located about 1,000 feet to the southwest across Highway 237. Other sensitive uses are residential neighborhoods located about 0.5 mile to the southwest, about 1 mile to the east across Interstate 880 in the City of Milpitas, and about 1.75 miles to the west in the community of Alviso.

Comparison to the Proposed Project

Similar to the proposed project, a power plant at site Alt-2 would require a General Plan amendment to Public/Quasi-Public.

Site Alt-2 is located within the area covered by the Alviso Master Plan (SJ 1998). As discussed earlier for site Alt-1, although not a use specifically identified by the Alviso Master Plan, a power plant at site Alt-2 would appear to be consistent with many of the plan's guiding principles. In addition, the industrial development standards contained in the Alviso Master Plan are not as restrictive as those in the North Coyote Valley Campus Industrial Area Master Development Plan. A power plant at site Alt-2 would likely be able to meet these standards, and thus avoid the inconsistencies with development guidelines and standards that the proposed project would have.

Similar to the proposed project, a power plant at site Alt-2 would not disrupt or divide the physical arrangement of an established community since land in the immediate vicinity is either undeveloped or used for agriculture and a few residences.

Site Alt-2 would be adjacent to the proposed Los Esteros Substation. Therefore, similar to the proposed project, an electrical interconnection line would not disrupt or divide the physical arrangement of an established community.

Similar to the proposed project, development at site Alt-2 would have a significant and unmitigable impact on agriculture since 30 acres of Prime Farmland would be converted to non-agricultural use.

Unlike the proposed project, development of a power plant at site Alt-2 would displace several residences.

Staff does not expect that a power plant at site Alt-2 would cause significant land use incompatibilities due to unmitigated significant impacts in regard to resource areas such as public health, traffic, noise, or visual impacts. Therefore, use of site Alt-2 would avoid the land use incompatibility impact of the proposed project in regard to significant unmitigable visual impacts. Construction of PG&E's Los Esteros Substation is a prerequisite for use of site Alt-2. The substation would remove the remainder of the residences on the 54.6-acre parcel. Two small farmhouses are located about 430 feet and 980 feet from the east property line of site Alt-2. Site Alt-2 is a 30-acre site. Locating the noise generating components of the power plant in the northwest quadrant of the site would place the project about 1,000 feet from the nearest residence. This is approximately the same distance to the nearest residence as the proposed project. The remainder of the site could be used for other project elements and a buffer area, both of which would provide noise mitigation. Therefore, similar to the proposed site, it would be technically feasible to mitigate noise impacts on the nearest residence to a less than significant level at site Alt-2.

Alt-3

Site Alt-3 is located on a parcel of land that is partially occupied by the existing Borden Chemical facility, which includes an existing 0.2 MW power plant. Site Alt-3 consists of the vacant portion of the parcel. The property is currently designated General Industrial by the City of Fremont General Plan, and is zoned General Industrial (G-I). Adjacent land uses are industrial, including a large wallboard manufacturing plant (Celotex) and warehouses. Along the southern boundary of the parcel are an active railroad spur and electrical transmission line. South of the site across Stewart Avenue is an office park. A light industrial park is being constructed on property located about 1,000 feet west of site Alt-3 in the City of Newark. Nearby sensitive land uses include a high-density residential area located about 1,200 feet northwest of site Alt-3 in the City of Newark. The Celotex industrial facility and Stevenson Road separate this residential area from the site. There are three schools located between two-thirds of a mile and one mile of site Alt-3 to the north and northeast and across Interstate 880.

Comparison to the Proposed Project

The City of Fremont's General Industrial designation allows all types of industrial uses. Certain industries with significant environmental impacts (e.g., noise, or dust), nuisance or hazardous characteristics can only locate in areas with this designation (Fremont, 1991). Uses allowed with a conditional use permit in the General Industrial zoning district include manufacturing uses such as meat packing plants, poultry dressing plants, petroleum refining and related industries, and any other use which the planning commission finds is similar in nature, function, or operation to other conditional uses allowed within the district (Fremont 1991). Uses permitted with a zoning administrator permit include electric, gas, and sanitary services, and the manufacturing of chemicals and allied products. The zoning

administrator may also permit any other use that he finds similar in nature, function, and operation to other zoning administrator permitted uses within the district. Although a power plant is not specifically listed as a permitted or conditionally permitted use in the General Industrial district, staff believes the zoning ordinance provides ample discretion to allow such a use. Thus, unlike the proposed site, development of a power plant at site Alt-3 would not require rezoning of the site. It also would not require a General Plan amendment.

The Fremont General Plan and Zoning Ordinance restrict General Industrial uses to a building height of 40 feet (warehouses are allowed to a height of 60 feet). The General Plan allows exceptions to the height limitation. At the City's discretion. General Plan Policy LU 3.7 allows additional height based on one or more of the following three criteria: extraordinary benefit to the City; unique circumstances or special project design which would reduce visual impacts in comparison to other projects; and the unique building requirements of a particular industrial use. The necessity for 145-foot tall HRSG stacks to meet air quality standards may satisfy the criteria for a height exception. This nonconformity may or may not be acceptable to the local government.

Other applicable development standards in the Fremont G-I zoning district are:

- Minimum Landscaped Yard between Street and Parking: 10 feet
- Minimum landscaped area between areas for parking or vehicular circulation and an interior lot line: 3 feet
- Minimum Landscaped Yard between Street and Building: 15 feet
- Minimum Yard between a Building and an Interior Lot Line: 0 feet (However, at least 2 adjoining sides of buildings must have a minimum "accessible" yard of 20 feet for fire fighting equipment. This can include parking areas and adjacent public street frontage).
- Floor Area Ratio Standard: .35

These development standards are much less restrictive than those in the North Coyote Valley Campus Industrial Area Master Development Plan. A power plant at site Alt-3 would likely be able to meet these standards. Thus, use of site Alt-3 would likely avoid the inconsistencies with development standards that the proposed project would have.

Similar to the proposed project, a power plant at site Alt-3 would not disrupt or divide the physical arrangement of an established community because the immediate area is primarily industrial and commercial.

Site Alt-3 is approximately one mile north of the Newark Substation. An electrical transmission interconnection route would be either aboveground or underground in city streets. Land uses along this route are industrial, and include a PG&E

equipment yard, gas metering plant, and an industrial park. Therefore, similar to the proposed project, a transmission line would not disrupt or divide the physical arrangement of an established community. Although an aboveground transmission line to site Alt-3 would be longer and therefore more visible than the proposed project's transmission line, it would be compatible with the character of the surrounding land uses.

Site Alt-3 contains soils classified as Farmland of Statewide Importance and Prime Farmland (USDA 1981). However, site Alt-3 is not currently being used for agriculture and has not been used for the production of irrigated crops for at least the last 6 years. For these reasons, site Alt-3 is classified as Urban on the 1998 Important Farmland Map for Alameda County (CDC 1999b). The site is zoned for General Industrial uses and surrounded by industrial and commercial uses, and would not likely be used for agriculture in the future. Since site Alt-3 is not classified as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance on the Important Farmland Maps, its use would have a less than significant impact on agriculture as defined by the CEQA Guidelines. Therefore, use of site Alt-3 would avoid the significant and unmitigated impact on Prime Farmland that the proposed project would cause.

Staff does not expect that a power plant at site Alt-3 would cause significant land use incompatibilities, such as unmitigated noise, public health, traffic, or visual impacts. A power plant at site Alt-3 would be compatible with the industrial character of the adjacent land uses (Borden Chemical and Celotex). Therefore, use of site Alt-3 would avoid the land use incompatibility impacts of the proposed project in regard to significant and unmitigable visual impacts.

Alt-4

Site Alt-4 consists of two parcels totaling 20.66 acres. The site is currently designated General Industrial by the City of Fremont General Plan, and is zoned General Industrial. The site is currently vacant. Surrounding land uses are industrial and commercial, including a lumberyard, a truck trailer and railcar storage yard, and a large RV storage yard. A huge GM/Toyota car manufacturing plant is located approximately 0.5 mile to the south of site Alt-4. Sensitive land uses in the vicinity of site Alt-4 include a residential area located about 0.5 mile to the east and across Interstate 680, a residential area located about 0.75 mile to the north, and a school located about 4,500 feet to the northwest.

Several residences are located east and southeast of site Alt-4. There are three former residences and one occupied residence located east of site Alt-4 across Old Warm Springs Road. (The three former residences have boards over their windows.) According to the Fremont Zoning Map, the properties these residences are located on are zoned General Industrial. The Zoning Ordinance specifically prohibits residential uses in the General Industrial zoning district (Fremont 1999). These residences presumably predate the zoning ordinance and would be nonconforming uses. On a recent visit to site Alt-4, staff noticed a "For Sale" sign advertising these properties for research and development, office and manufacturing uses. Another three residences located southeast of site Alt-4

across South Grimmer Boulevard and Old Warm Springs Road, would remain. These properties, which are adjacent to a transmission line and railroad right-of-way, are also designated General Industrial on the Fremont Zoning Map.

Comparison to the Proposed Site

As discussed above for site Alt-3, although a power plant is not specifically listed as a permitted or conditionally permitted use in Fremont's General Industrial zoning district, the zoning ordinance provides discretion to allow such a use. Thus, unlike the proposed site, development of a power plant at site Alt-4 would not require rezoning of the site. It also would not require a General Plan amendment, unlike the proposed site.

The Fremont General Plan and Zoning Ordinance restrict General Industrial uses to a building height of 40 feet (warehouses are allowed to a height of 60 feet). The General Plan allows exceptions to the height limitation. At the City's discretion. General Plan Policy LU 3.7 allows additional height based on one or more of the following three criteria: extraordinary benefit to the City; unique circumstances or special project design which would reduce visual impacts in comparison to other projects; and the unique building requirements of a particular industrial use. The necessity for 145-foot tall HRSG stacks to meet air quality standards may satisfy the criteria for a height exception. This nonconformity may or may not be acceptable to the local government.

The General Industrial (G-I) zoning district development standards are much less stringent than those in the North Coyote Valley Campus Industrial Area Master Development Plan. A power plant at site Alt-4 would likely be able to meet the G-I development standards other than the height restriction and avoid the other inconsistencies of the proposed project with design guidelines and standards.

Similar to the proposed project, a power plant at site Alt-4 would not disrupt or divide the physical arrangement of an established community because the area is primarily industrial and commercial.

Site Alt-4 is located approximately two miles southeast of PG&E's Newark Substation. One possible electrical transmission interconnection route would be overhead for approximately three miles, first along a corridor that contains an existing 115 kV transmission line then along another corridor that contains two 230 kV transmission lines and one 115 kV transmission line. Because this route would be within existing utility corridors, the route would not disrupt or divide the physical arrangement of an established community. A second possible route would be underground for approximately two miles in city streets. Such an underground line would not disrupt or divide the physical arrangement of an established community. Thus, similar to the proposed project, an electrical transmission line would not have a significant adverse land use impact.

Site Alt-4 contains soils classified as Prime Farmland and Farmland of Statewide Importance (USDA, 1981). However, site Alt-4 is not currently being used for agriculture. Since 1988, site Alt-4 has been classified either Urban or Other Land

(lands which do not meet the criteria for any other category) on the Important Farmland Maps for Alameda County (CDC, 1999b). The 1998 Important Farmland Map classifies the site as Other Land. The site is currently zoned for General Industrial uses and is surrounded by primarily industrial and commercial uses, and would not likely be used for agriculture in the future. Since site Alt-4 is not classified as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance on the Important Farmland Maps, its use would have a less than significant impact on agriculture as defined by the CEQA Guidelines. Therefore, use of site Alt-4 would avoid the significant and unmitigated impact on Prime Farmland that the proposed project would cause.

Staff does not anticipate that a power plant at site Alt-4 would cause significant adverse land use incompatibilities, such as unmitigated public health, traffic, or visual impacts. Therefore, use of site Alt-4 would avoid the land use incompatibility impacts of the proposed project in regard to significant unmitigable visual impacts. Of the residences likely to remain near site Alt-4, the closest is located about 500 feet from the southeast corner of site Alt-4. Site Alt-4 is a 20-acre site. Locating the noise generating components of the power plant in the western portion of the site would place those components about 1,000 feet from the nearest residence. This is approximately the same distance to the nearest residence as the proposed project. The remainder of the site could be used for other project elements and a buffer area, both of which would provide noise mitigation. Therefore, similar to the proposed project, it would be technically feasible to mitigate noise impacts on the nearest residence to a less than significant level.

Alt-5 and Alt-6

Site Alt-5 is located on a 49.53-acre parcel in rural eastern Alameda County. The site is adjacent to the north side of PG&E's Tesla Substation. Site Alt-6 is located on a 299.1-acre parcel adjacent to the northwest side of the Tesla Substation. Both sites are currently used for grazing. The western portion of site Alt-6 is also used for wind energy production. Surrounding land is used for grazing and wind energy production. In addition, there are seven residences along Midway Road and three residences on Patterson Pass Road in the vicinity of sites Alt-5 and Alt-6. The closest of these residences is about 2,000 feet from site Alt-5 and about 3,000 feet from site Alt-6.

Sites Alt-5 and Alt-6 are both designated Large Parcel Agriculture by the Alameda County General Plan, and zoned A-B-E, which requires parcels to be a minimum of 160 acres unless they were created before 1972. The minimum parcel size on which building is allowed is 160 acres, also with an exception for parcels created before 1972. The parcel for site Alt-5 was created before 1972. Uses allowed by the Large Parcel Agriculture designation include low intensity agricultural uses (such as alfalfa, cattle and horse grazing), high intensity agricultural uses (such as row crops and vineyards), windfarms and related facilities, utility corridors, and other industrial uses appropriate for remote areas and determined to be compatible with agriculture (Alameda County, 1994). According to Alameda County planning staff, a power plant would be considered a public utility, which is an allowed use in any zoning district in Alameda County (Tarbell 2000). According to the applicant's

conversations with the Alameda County Zoning Administrator, a power generation facility is a conditional use under the zoning designation and would ordinarily require a Conditional Use Permit (PSA Comments Set 3, p. 33). However, since the issuance of a certificate by the Energy Commission is in lieu of any local permit (Pub. Resources Code, § 25500), a thermal power plant (50 MW and larger) would not require a Conditional Use Permit from Alameda County.

Comparison to Proposed Project

Unlike the proposed site, a power plant at sites Alt-5 or Alt-6 would not require a zoning change since power plants are an allowed use in any zoning district. It would also not require a General Plan Amendment since a power plant could be allowed by the current General Plan designation of sites Alt-5 and Alt-6 since it would be compatible with surrounding agricultural uses (cattle grazing).

Similar to the proposed project, a power plant at sites Alt-5 or Alt-6 would not disrupt or divide the physical arrangement of an established community since it would be located on grazing land and agricultural uses predominate in the area.

Sites Alt-5 and Alt-6 are adjacent to the Tesla Substation. Therefore, similar to the proposed project, an electrical interconnection line would not disrupt or divide the physical arrangement of an established community.

Sites Alt-5 and Alt-6 consist of Prime Farmland and Farmland of Statewide Importance soils (USDA, 1966). However, sites Alt-5 and Alt-6 are classified Grazing Land on the 1998 Important Farmland Map for Alameda County (CDC, 1999b). Since sites Alt-5 or Alt-6 are not classified as Prime Farmland, Unique Farmland, or Farmland of Statewide Importance on the Important Farmland Maps, their use would not have a significant impact on agriculture as defined by the CEQA Guidelines. Therefore, use of site Alt-5 or Alt-6 would avoid the significant and unmitigated impact on Prime Farmland that the proposed site would have.

Staff does not expect that a power plant at sites Alt-5 or Alt-6 would cause significant adverse land use incompatibilities, such as unmitigated noise, public health, traffic, or visual impacts. Therefore, use of either sites Alt-5 or Alt-6 would avoid the land use incompatibility impacts of the proposed project in regard to significant unmitigable visual impacts.

SUMMARY

A power plant at site Alt-1 or Alt-2 would avoid the proposed project's significant land use impact regarding incompatibility with nearby land uses due to a significant visual impact on nearby residences. It would result in a significant land use impact regarding the loss of prime farmland. A power plant at site Alt-1 or Alt-2 would require a General Plan amendment, zoning change, and annexation into the City of San Jose, as would the proposed project. These actions may or may not be approved by the City.

A power plant at site Alt-3 or Alt-4 would avoid the significant unmitigated adverse land use impact that the proposed project would have on prime farmland. A power

plant at site Alt-3 or Alt-4 would avoid the proposed project's significant land use impact regarding incompatibility with nearby land uses due to a significant visual impact on nearby residences. A power plant at site Alt-3 or Alt-4 would not require a General Plan amendment or zoning change but would be in noncompliance with a local height restriction because it would not conform to the City of Fremont's restriction of general industrial uses to a building height of 40 feet. This noncompliance may or may not be acceptable to the City of Fremont.

A power plant at site Alt-5 or Alt-6 would not require a General Plan amendment or zoning change, unlike the proposed project. Use of either site would avoid the significant unmitigated impact on Prime Farmland that the proposed project would have. A power plant at site Alt-5 or Alt-6 would avoid the land use incompatibility impact of the proposed project in regard to a significant visual impact on a nearby land use.

NOISE

ANALYSIS

It is technically and, typically, economically feasible to mitigate power plant noise impacts to a level of insignificance. The chief factor in determining the cost, and thus the feasibility, of this mitigation is the distance to the nearest sensitive noise receptor.¹ The nearest receptor to the proposed project site is a farm residence approximately 1,150 feet south of the site. The proposed project would mitigate noise emissions to a level of insignificance at this residence.

Alt-1

This site is currently in agricultural use. The nearest sensitive noise receptor that would remain after development of the proposed Los Esteros Substation is approximately 1,300 feet distant.

Alt-2

This site is also currently in agricultural use. The nearest sensitive receptor that would remain after development of the proposed Los Esteros Substation is approximately 330 feet from the site boundary. Site Alt-2 is large enough (30 acres) to locate the noisier power plant elements approximately 1,100 feet from the closest sensitive receptor.

Alt-3

This site lies adjacent to a Borden Chemical facility in Fremont. The nearest sensitive receptor is approximately 1,000 feet distant.

Alt-4

This site lies in an industrial and commercial neighborhood in Fremont. The nearest sensitive noise receptor is approximately 324 feet distant. Site Alt-4 is large

¹ Sensitive receptors include residences, schools, libraries, hospitals, places of worship and any other uses for which quiet is important.

enough (over 20 acres) to locate the noisier power plant elements approximately 1,100 feet from the closest sensitive receptor.

Alt-5

This site lies in a rural portion of Alameda County. There are no sensitive noise receptors within range of any power plant noise emissions.

Alt-6

This site also lies in a rural portion of Alameda County. There are no sensitive noise receptors within range of any power plant noise emissions.

SUMMARY

The nearest sensitive noise receptors at alternative sites Alt-1 and Alt-3 are effectively the same distance from the project as is the nearest receptor at the proposed site. Sites Alt-2 and Alt-4 are large enough to allow noisier power plant elements to be located approximately the same distance from the closest sensitive receptor as for the proposed site. Mitigating project noise emissions to a level of insignificance at these four sites would thus cost approximately the same as at the proposed site.

The nearest sensitive receptors at alternative sites Alt-5 and Alt-6 are so far away as to be effectively nonexistent. Mitigation of project noise emissions to a level of insignificance at these sites would thus be cheaper than at the proposed site.

After mitigation, no significant adverse noise impacts are expected at either the proposed site or any of the alternative sites.

PUBLIC HEALTH

ANALYSIS

Public health impacts due to power plants are generally due to air emissions. Project-related emissions are generated during facility construction and operation.

Construction

Construction of the proposed project would result in diesel exhaust emissions from heavy equipment. These emissions have the potential to cause short-term health effects. The type, duration, and amount of diesel exhaust from construction of the facility itself would be about the same regardless of project location. However, site-specific differences in hazardous substance contamination could affect the level of remediation required, resulting in differences in quantities of diesel exhaust from earth moving equipment.

Site specific differences in the location of sensitive receptors such as residential areas and schools could affect the public's exposure to the toxic substances contained in equipment exhaust. Sites Alt-1, 2, 3, and 4 are all within about one-half mile of residences, as is the proposed Metcalf site. Sites Alt-5 and 6 are within

about one mile of residences. Air emission dispersion modeling for each site is necessary to accurately predict differences in public exposure to diesel exhaust, but sites Alt-5 and 6 could have the lowest potential, since they are farthest from residences. Conversely, sensitive receptors nearest to sites Alt-3 and 4 may have the highest potential for exposure to diesel exhaust, since both of these sites are located in industrial areas, and may have the highest potential for existing contamination, which could require more use of heavy equipment for remediation. Unless there are individual residences very close to a proposed site, it is unlikely that construction emissions would cause significant health impacts at the proposed or alternative sites, because their concentrations tend to decrease within a short distance. If significant health effects are anticipated, mitigation measures such as exhaust emission controls or limiting the operation of heavy equipment may be considered to reduce the level of impact to below significance.

Operation

Hazardous substances emitted from routine operation will be substantially similar regardless of the location of the project, since such emissions are a function of facility design. The proposed Metcalf facility is not likely to result in significant long-term cancer or noncancer public health impacts. Although the location of sensitive receptors near a project site affects the public's exposure to toxic substances as discussed above, staff also believes it unlikely that there would be significant impacts to public health from long-term exposure to facility emissions at any of the alternative sites.

Health impacts from short-term (acute) exposure to project operational emissions at the proposed Metcalf site are not likely to be significant. The magnitude of short-term impacts depend on site-specific differences in the locations of sensitive receptors. However, staff believes that significant impacts at any of the alternative sites would be unlikely, although dispersion modeling would be necessary to confirm this. Sites Alt-5 and 6 could have less potential for short-term health impacts, since residences are somewhat further away at these two locations.

SUMMARY

The proposed project is not likely to cause significant adverse long-term health impacts (either cancer or noncancer) from exposure to toxic emissions, regardless of the site chosen. Short-term health impacts from both facility construction and operation may depend more on the location of nearby sensitive receptors. Staff believes it unlikely that health impacts would be significant at the proposed site or any of the alternative sites, but dispersion modeling at the alternative sites would be required to confirm this.

SOCIOECONOMICS

ANALYSIS

Of the six alternative sites (Alt-1 through Alt-6), most are located in the northern San Jose and Fremont area and two sites are located near PG&E's Tesla substation in eastern Alameda County. The number of workers, construction costs, payroll,

property tax revenues, and related items would be relatively the same. The majority of workers needed for construction would probably come from the San Jose/Santa Clara Valley though the Tesla sites might draw some workers from the Sacramento/Stockton area.

Staff assumes that, as noted in the Metcalf site analysis, workers would commute daily or weekly to the plant site. Some may move temporarily to the local area during construction. There could be some site-specific impacts in terms of housing, schools, utilities, and emergency services. If there were significant impacts identified, mitigation measures could be devised that would reduce these impacts to less than significant. For example, if there were a need for additional fire fighting equipment, such as is needed for the proposed site, staff would propose mitigation that would resolve the matter. Property tax revenues, payroll, and sales of necessary supplies would benefit the local community and the nearest metropolitan area.

The minority population within six miles of the proposed power plant site for 1999 was estimated to be 48 percent (Claritas 2000). After reviewing the U.S. Census Bureau data for Santa Clara and Alameda counties and the cities of San Jose, Fremont, Newark, Milpitas, and Tracy, it appears that there are significant minority or low-income populations near several of the alternative sites. Staff used 1990 census data regarding the minority population in the areas near the alternative sites. Sites Alt-1 and Alt-2 are in Santa Clara County, which has a 42 percent minority population. However, these sites are adjacent to the City of San Jose, which has a 45 percent minority population, and near the City of Milpitas, which has a 58 percent minority population. Sites Alt-3 and Alt-4 are in Fremont, which has a 36 percent minority population. However, these sites are near Newark, which has a 42 percent minority population. Pockets of minority population greater than 50 percent may exist in the area of impacts from placing the power plant at one of these sites. Further analysis would be necessary to determine if any such populations could be disproportionately impacted by the construction and operation of the power plant at these sites. The minority population in Alameda County is 47 percent, but it is reasonable to assume that the population of the eastern part of the county, near the Tesla substation, has a lower minority percentage. Also, very few people live in the vicinity. In comparison, Santa Clara County has a 42 percent minority population.

The low-income population in Alameda County is less than 20 percent (11.3 to 17.3 percent depending on age), while the corresponding figures for Santa Clara County range from 9.1 to 13.4 percent, based on age.

SUMMARY

The socioeconomic impacts of the Metcalf Energy Center would be generally the same at the proposed site or any of the alternative sites. As noted in the socioeconomic assessment for the proposed site in south San Jose, construction activities with appropriate mitigation would probably not cause a significant impact on housing, schools, utilities, or emergency and other services at any of the alternative sites. Benefits from the construction and operation of the power plant

regardless of its location include increases in the affected areas property and sales taxes, employment, and sales of service, manufactured goods and equipment.

SOIL AND WATER RESOURCES

ANALYSIS

The Proposed Project

The proposed MEC project would require three water systems: recycled water for cooling purposes; potable water for process, domestic, and back-up water needs; and an industrial wastewater discharge system for all plant wastewater.

Most of MEC's water demand would be required for cooling purposes. Estimated average use of water for cooling is 3.3 mgd² and estimated peak cooling water use is 4.7 mgd. The applicant proposes to use recycled water for cooling. The water would be obtained from the San Jose/Santa Clara Waste Water Treatment Plant (WWTP) through the South Bay Water Recycling Program. The applicant proposes to use groundwater as a back-up cooling water supply should recycled water service be interrupted.

Water requirements for non-cooling industrial processes and domestic uses are estimated at 0.2 mgd on average with a peak requirement of 0.69 mgd. If there is an interruption in the delivery of recycled water to the project, groundwater, at a maximum of 5.4 mgd would be used.

The applicant has not yet determined whether water will be supplied to the project by the City of San Jose or the Great Oaks Water District. Both the City and the water district have indicated that new wells will be required to serve the project. Calpine has identified two locations for two wells that could serve the project. Based upon these well locations, staff analysis concludes that groundwater pumping will not contribute to a significant project specific or cumulative impact to water resources.

The applicant estimates peak wastewater discharge at 1.9 mgd for three cycles of concentration and 0.6 mgd for five cycles. The City of San Jose has indicated that this discharge would result in a three percent increase in the salinity concentration of the WPCP's recycled water product, and thus, poses a significant unmitigated adverse environmental impact. Staff's analysis concludes that the elevated levels of total dissolved solids in the MEC wastewater has the potential to degrade recycled water. However, staff does not consider these impacts to be a significant effect on the environment as defined by CEQA. These discharges will, however, be addressed in the Industrial Wastewater Discharge Permit to be issued by the City of San Jose.

² Million gallons per day.

Alt-1 and Alt-2

Sites Alt-1 and Alt-2 are located in north San Jose, just north of State Route 237, east of Zanker Road and west of Coyote Creek. Both of these sites are located close to the San Jose/Santa Clara WPCP, which would serve as the recycled water supply for these sites. A route to the treatment plant from site Alt-1 would be approximately 4,000 feet long, while a route from site Alt-2 would be approximately 6,000 feet long. Staff expects that back-up water supplies would be provided through San Jose Municipal Water System Division (MUNI) primarily from groundwater resources, much like the proposed project. Wastewater from plant operations would have the same characteristics as for the proposed project and would be the same amount. The only differences between the proposed project and use of sites Alt-1 and Alt-2 are the length of the linear supply and discharge lines.

Alt-3 and Alt-4

Sites Alt-3 and Alt-4 could be served by one of two potential sources of recycled water: South Bay Water Recycling (SBWR) or the Alameda County Union Sanitary District (USD) Alvarado Waste Water Treatment Plant (WWTP). A connection from Alt-3 to the SBWR's system could be made at a location approximately eight miles from the site. The closest connection to SBWR's system is approximately seven miles from Alt-4. In order for the SBWR Program to serve a project at a site in Fremont such as Alt-3 or Alt-4, the Alameda County Water District would need to support it and LAFCO approval may be required. Connection to the USD WWTP would require an approximately eight-mile pipeline for Alt-3 and an 11-mile pipeline for Alt-4.

Potable water to serve the non-cooling industrial processes and domestic requirements can be obtained from the Alameda County Water District system. The closest source of potable water for Alt-3 is approximately seven miles away (McGhie 2000), while potable water for Alt-4 could be obtained from a line adjacent to the site. These connections can not provide the amount of water necessary for back-up supplies when recycled water is not available and would need to be augmented by another supply (groundwater or a separate connection to another line). It is questionable whether groundwater alone could supply the needed back-up requirements and further analysis would be required in the event this option is pursued.

If the recycled water is obtained from SBWR, the potential increased TDS levels in the wastewater product would be the same for Alt-3 or Alt-4 as for the proposed project. The impacts of this increase would be the same for Alt-3 or Alt-4 as for the proposed project and very similar if obtained from USD WWTP. However, discussions with the USD suggest that connection to the WWTP may not result in exceeding its discharge limits or violate any standard (Ernest 2000).

Alt-5 and Alt-6

Water Supply and Wastewater

Sites Alt-5 and Alt-6 are located in rural eastern Alameda County near PG&E's Tesla Substation. Staff contacted Alameda County, San Joaquin County, and the City of Tracy to determine whether disinfected, tertiary-treated recycled water could be made available to a power plant located at either of these sites. Staff learned that water service to Alt-5 or Alt-6 would likely be provided by San Joaquin County or the City of Tracy. City of Tracy staff stated that at this time, no facility in the area of the sites is capable of producing the required quality or quantity of reclaimed water. The earliest any plans anticipate a facility to be capable of generating reclaimed water is a minimum of five years from now.

Staff investigated other options for water supply that included ground water from local existing wells or new wells and local water service from the City of Tracy or San Joaquin County. Staff has not investigated the use of irrigation return flow for use in cooling nor the availability of State Water Project water for cooling. Presently the City of Tracy uses groundwater. They also use surface water through a contract for a maximum of 10,000 acre-feet per year. Their system has a maximum treatment capacity of 25 mgd (10 mgd of well water and 15 mgd of surface water). Current demand on the City's potable water system is approximately 21 mgd. According to City of Tracy staff, the City's current system is insufficient to serve the entire water needs of a project such as MEC. It is possible that the City could provide water service for the peak potable non-cooling industrial processes and domestic needs (0.69 mgd), but not for cooling purposes (4.7 mgd). The City would be very concerned about the impacts from new wells for such a project because the groundwater resources may be inadequate to supply the needed amount of water.

The nearest service line to sites Alt-5 or Alt-6 is located at I-580 and Patterson Pass Road, approximately two miles from the sites.

For the County to provide the water would most likely require new wells because the existing infrastructure is insufficient for the amount required.

The State Water Resources Control Board's Policy 75-58 states in part that "fresh inland waters should only be used for power plant cooling if other sources or methods of cooling would be environmentally undesirable or economically unsound." This policy states that power plant cooling water should, in order of priority, come from wastewater being discharged to the ocean, ocean water, brackish water from natural sources or irrigation return flow, inland waste waters of low total dissolved solids, and other inland waters. The proposed project would use recycled water that would otherwise be discharged to the ocean, obtained from the SBWR Program, and is consistent with the SWRCB policy. Use of fresh inland water for a power plant at sites Alt-5 or Alt-6 would not be consistent with this policy. Use of dry cooling would be consistent with the policy, but the benefits associated with the use of recycled water would not be realized.

Dry Cooling and Wet/Dry Cooling

Dry cooling systems are a technically feasible alternative to wet cooling. These systems use less water and eliminate the occurrence of visible vapor plumes. However, these systems are less efficient in rejecting heat, and generally require more electricity and create higher pressure in the steam turbine condenser. These factors decrease the thermal efficiency and power output of the plant. In addition, capital costs of dry cooling systems are two to four times as much as wet cooling systems.

Dry cooling could be employed at any of the sites under consideration assuming that space is available. If evaporation ponds are used for wastewater, the space required would increase. For sites Alt-5 and Alt-6, dry cooling could be considered a preferred alternative to using groundwater or potable water and would result in less wastewater to be discharged. However, the benefits associated with the use of reclaimed water would not be realized, the facilities would be less efficient, capital costs would be higher, and air emissions would be higher (as a result of having to use more fuel for the same level of electrical output).

Wastewater

Wastewater in this region is normally handled by the City of Tracy, but currently there is little capacity available to accommodate the 0.6 mgd of wastewater expected (Bayley 2000a, Guzman 2000). The City's wastewater treatment facility has a capacity to treat 9 mgd. The facility treated more than 7 mgd last year, and has treated its capacity in the past. Pipelines near sites Alt-5 and Alt-6 have no available capacity and thus new conveyance infrastructure would be required. If the project is likely to concentrate salts that may increase the salinity of the City's effluent, the wastewater could not be accepted (Bayley 2000a). Therefore, wastewater generated from the project would likely have to be discharged to evaporation ponds or may require a zero discharge system. A zero discharge system is proposed for two other power plant projects under consideration by the Energy Commission.

Stormwater Discharge

At any alternative site an erosion and sediment control plan would be needed to mitigate any potential for impacts due to erosion. In addition, a project of this nature would have to comply with National Pollutant Discharge Elimination System permit requirements, developing and implementing a Storm Water Pollution Prevention Plan for both construction and operation activities. Consequently, the erosion and stormwater related impacts would be essentially the same for each of the alternative sites as for the proposed project.

SUMMARY

Sites Alt-1 or Alt-2 would be very similar to the proposed project in regard to a power plant's water needs, available water supplies, and wastewater discharge impacts.

A power plant at site Alt-3 or Alt-4 could use recycled water from two sources. One source is the same as that proposed for the MEC project: the South Bay Water Recycling (SBWR). Use of that source would cause the same level of impact as the proposed project to discharge salinity. Use of the other source, the USD Alvarado WWTP, for site Alt 3 or Alt-4 would have similar impacts, but would avoid discharge to the SBWR.

Several water-related constraints not associated with the proposed project are associated with sites Alt-5 and Alt-6, including the lack of sufficient available water supplies and treatment capacity for wastewater discharge. If the project were modified to employ dry cooling, which is a technically feasible option, these constraints may be lessened. However, water-related impacts may still result from providing the remaining potable water needs and handling the wastewater discharge for either of these sites. In addition, the benefits associated with the proposed project's use of recycled water (and thus a reduction of the amount of effluent being discharged by SBWR to the South Bay) would not occur. To address wastewater discharge concerns, sites Alt-5 and Alt-6, because of their large size, could accommodate a zero discharge wastewater system, unlike the proposed site. This could avoid any impacts associated with evaporation ponds or the lack of wastewater treatment capacity at these sites. However, these technologies have the disadvantages of decreased efficiency, increased capital costs, additional land requirements, and increased air emissions. In addition, the benefits associated with the proposed project's use of recycled water (and thus the reduction of the amount of effluent being discharged by SBWR to the South Bay) would not occur.

TRAFFIC AND TRANSPORTATION

ANALYSIS

Alt-1 and Alt-2

Sites Alt-1 and Alt-2, located adjacent to Milpitas (north of Highway 237 and east of Zanker Road), would utilize the same access. The sites are surrounded by agricultural land and by agricultural facilities and buildings that house residents engaged in agricultural work. The main traffic concern for these alternatives is site access. Access to either site would be provided via a private road leading to the site off of Zanker Road.

The major traffic impact associated with site Alt-1 or Alt-2 would be the potential delays caused on Zanker Road, which is a two-lane roadway with modest amounts of traffic. A left-turn pocket and the associated road widening on Zanker Road would be needed. Any impacts associated with the construction of natural gas or water supply facilities within or adjacent to a public roadway in the vicinity of this alternative location would require a traffic control plan similar to the plan for the proposed project. Unlike the project, the need for railroad crossings equipment (gates and signals) is not relevant for these two sites because no crossings exist in their vicinity.

Alt-3

Site Alt-3, located in Fremont adjacent to Boyce Road between Stevenson Boulevard and Stewart Avenue, would result in little or no traffic impacts. This site is situated on a vacant portion of the Borden Chemical facility on Boyce Road and is surrounded by industrial uses. Boyce Road is a 4-lane roadway with northbound and southbound left-turn pockets between Stevenson Boulevard and Stewart Avenue serving the existing industrial land uses. An unused left-turn pocket exists on Boyce Road directly adjacent to the proposed alternative site. Boyce Road carries substantial traffic volume as well as modest bike travel (the roadway has a bike lane).

Site Alt-3 has similar traffic characteristics to the proposed project, with the exception of a controlled railroad crossing. Since a left-turn pocket into the proposed site from Boyce Road already exists, no site access problems are expected. A railroad crossing with adequate site distance, active gates, and signals exists on Boyce Road near the southern border of Alt-3. Any impacts associated with the construction of natural gas or water supply facilities within or adjacent to a public roadway in the vicinity of this alternative location would require a traffic control plan similar to the plan for the proposed project.

Alt-4

Site Alt-4, located in Fremont adjacent to Grimmer Boulevard between Fremont Boulevard and Old Warm Springs Road, would cause minor traffic impacts. This site is located on a flat and vacant parcel and is surrounded by a combination of industrial and commercial uses.

Access to the site could be provided via Grimmer Boulevard or Old Warm Springs Road to avoid the greater impact that would result by providing access via Fremont Boulevard, which has higher traffic volumes. Grimmer Boulevard is a four-lane roadway with bike lanes separated by a raised median between Fremont Boulevard and Old Warm Springs Road. An eastbound left-turn pocket serves Kato Road and a westbound left-turn pocket serves the existing commercial land uses adjacent to the proposed alternative site. Grimmer Boulevard carries a substantial amount of vehicle traffic. Old Warm Springs Road is a 30-foot two-lane roadway adjacent the site with no shoulders. Old Warm Springs Road carries much less traffic than Grimmer Boulevard. The intersection of Grimmer Boulevard and Old Warm Springs Road is all-way stop-controlled with crosswalks on all approaches. Delays on either Grimmer Boulevard or Old Warm Springs Road would result with site Alt-4 depending on where the site access is provided.

Site access would need to be provided via Old Warm Springs Road since this option would exhibit the least traffic impact for site Alt-4. A left-turn pocket and the associated road widening necessary for this improvement would be needed on Old Warm Springs Road north of Grimmer Boulevard to reduce any delays that may result from use of the site. The need for railroad crossings equipment (gates and signals) is not relevant at this location since no crossings exist in the vicinity of this alternative site. Any impacts associated with the construction of natural gas or water supply facilities within or adjacent to a public roadway in the vicinity of this

alternative location would require a traffic control plan similar to the plan for the proposed project.

Alt-5 and Alt-6

Sites Alt-5 and Alt-6, located adjacent to Midway Road near the eastern border of Alameda County, have little if any traffic concerns. Midway Road is a two-lane roadway with little or no shoulder width, carrying relatively low traffic volumes. These sites are surrounded by PG&E's Tesla Substation to the south and grazing land to the north, east and west.

The provision for a left-turn pocket into Sites Alt-5 or Alt-6 from Midway Road would probably not be needed because the existing traffic volumes on this roadway are relatively low. Any impacts associated with the construction of natural gas or water supply facilities within or adjacent to a public roadway in the vicinity of this alternative location would require a traffic control plan similar to the plan for the proposed project.

SUMMARY

Sites Alt-1 and Alt-2 would differ from the proposed project in that a left-turn pocket would be needed to provide access but there would be no need to install railroad crossing equipment (which the proposed project would require), because there is no railroad nearby.

Site Alt-3 would differ from the proposed project in that railroad crossing equipment would not be needed, because there is no railroad nearby.

Site Alt-4 would differ from the proposed project in that railroad crossing equipment would not be needed, because there is no railroad nearby; however, a left-turn pocket may be needed depending upon the choice of access location.

Sites Alt-5 and Alt-6 would differ from the proposed project in that railroad crossing equipment would not be needed because there is no railroad nearby.

Neither the proposed project or any of the six alternative sites would generate any significant environmental impacts; therefore, they are not substantially different with respect to transportation.

VISUAL RESOURCES

The Proposed Project

The **VISUAL RESOURCES** section of the FSA concludes that the proposed project would cause significant unmitigable visual impacts to nearby residences and to the visual quality and visual character of North Coyote Valley, and would contribute to significant cumulative visual impacts.

Alt-1

Site Alt-1 is currently open agricultural land. The landscape in the site vicinity includes other open agricultural land to the east and west, greenhouses and farm worker housing to the south, and the large San Jose/Santa Clara Waste Water Treatment Plant (WWTP) to the north and northwest. State Route 237, which carries a high volume of traffic, is slightly farther to the south and Zanker Road is slightly farther to the west. Views across the site from Zanker Road include Mission Peak, a regional landmark, in the background. The current visual quality for some views of the site and its surroundings (i.e., from portions of Zanker Road and Highway 237) is moderately high given the primarily rural and natural landscape character. Other views toward the site contain structures that reduce their intactness and visual quality to moderate or lower.

Use of the site for a power plant is contingent on construction of PG&E's proposed Los Esteros Substation (immediately to the south of Site Alt-1) and related transmission lines. The environmental setting for a project at Site Alt-1 would thus have substantial heavy industrial components that would reduce its visual quality to low to moderately low (see PG&E 1998, Figure 16-14). The number of nearby residences is low, and some of them would be removed to construct the substation. The substation would screen or dominate the view of the site from the two residences located nearest the site. Other residences in the vicinity, including in the trailer park approximately $\frac{3}{4}$ mile to the southwest across State Route 237 and residences about 1 to 1.5 miles away in Alviso, are beyond foreground viewing distances.

State Route 237 carries a high volume of daily traffic. Although it is assumed to carry mostly work-related travelers, it also carries many people traveling for leisure and recreation. The site is not in the primary field of view for travelers on the highway. The site is more visible from Zanker Road, which is somewhat rural in character. It is assumed that most travelers on this road are also work related with a moderate number of people traveling for leisure or recreation destinations. Because of the high volume of travelers using Highway 237 and the rural nature of Zanker Road, the visual sensitivity for foreground views of the site is moderate to moderately high for these views. The Bay Trail, an important regional trail, is proposed to be located near and possibly adjacent to the site. Potential future views from the trail would have high visual sensitivity.

For views from Highway 237 and by northbound travelers from Zanker Road, the substation and related transmission lines would dominate views of the site and a power plant that could be sited there. For views by southbound travelers from Zanker Road, the substation and related transmission lines would also dominate their views of the site. Views toward the site from residences and commercial buildings in the vicinity would be dominated by the substation adjacent to the south side of the site. For all of these views, due to the presence of the substation, the addition of a power plant would not substantially reduce visual quality. Future views from the Bay Trail that may potentially run near or adjacent to the site would be of concern; however, visual quality of views of the site would be moderately low to low because of the presence of the substation and visual quality would not be

substantially reduced by the addition of the power plant. In addition, the timing for implementing the trail is unknown and could occur after construction of the substation and power plant and therefore may not be part of existing conditions for siting of the power plant. Considering all of these factors, staff expects that use of Site Alt-1 for the power plant would cause adverse but not significant visual impacts

The substation and related transmission lines would be likely to cause significant adverse visual impacts for views of the area. The power plant would contribute to a cumulative visual impact in combination with the substation and related transmission lines that would also be likely to be significant.

Alt-2

Site Alt-2 is currently occupied by decrepit greenhouses and agricultural worker housing. The landscape in the site vicinity includes open agricultural land to the east and west, greenhouses and farm worker housing to the north, and the large WWTP farther to the north and northwest. Views across the site from Zanker Road include Mission Peak, a regional landmark, in the background. The current visual quality for some views of the site and its surroundings (i.e., from portions of Zanker Road and Highway 237) is moderately high given the primarily rural and natural landscape character. Other views toward the site contain structures that reduce their intactness and visual quality to moderate or lower.

State Route 237 carries a high volume of daily traffic and runs close to the south side of the site. Although it is assumed to carry mostly work-related travelers, it also carries many people traveling for leisure and recreation. Because the site is close to and within the primary field of view for travelers on the highway and the highway carries a high volume of travelers, visual sensitivity for views from the highway would be moderately high. Zanker Road, which is somewhat rural in character, is to the west of the site. It is assumed that most travelers on this road are also work related with a moderate number of people traveling for leisure or to or from recreation destinations. Visual sensitivity for views from Zanker Road is also moderately high because of its somewhat rural character. The Bay Trail, an important regional trail, is proposed to be located near and north of the site. Potential future views from the trail would have high visual sensitivity.

Use of the site for a power plant is contingent on construction of PG&E's proposed Los Esteros Substation (immediately to the north of Site Alt-2) and related transmission lines. The environmental setting for a project at Site Alt-2 would thus have substantial heavy industrial components and visual quality would be low to moderately low (see PG&E 1998, Figure 16-14). The number of nearby residences is low, and some of them would be removed to construct the substation and on Site Alt-2. Two residences located near the site would have foreground views of the site and high visual sensitivity. Other residences in the vicinity, including in the trailer park approximately ½ mile to the southwest across State Route 237 and residences at least 1¼ mile away in Alviso are beyond foreground viewing distances.

For views toward the site from Highway 237 and both northbound and southbound travelers from Zanker Road, the substation and related transmission lines would be

prominent elements of the setting. With the substation located immediately north of the site, the visual quality of views of the site and its surroundings would be low to moderately low.

The power plant would be very close to the heavily-used highway in a location where its mass and height would dominate the views in both directions from the highway. The power plant could block views toward the hills and the bay from the highway and some views of the hills from Zanker Road, and would be likely to reduce the visual quality of those views.. However, because the baseline condition for views of the area would include foreground views of the future substation and related transmission lines and these views would be low to moderately low in visual quality, the addition of the power plant would not substantially reduce visual quality of views from the highway and Zanker Road below the level of moderately low to low and this impact is not be expected to be significant. The visual impacts of locating the power plant in close proximity to the highway would potentially cause adverse visual impacts because of its height, mass, and potential to obscure views of hills and other features of the landscape. Therefore, special design treatment of the power plant would be important to help fit it with its surroundings, minimize its visual impacts, and potentially screen views of the substation from the highway.

Views toward the site from residences and commercial buildings in the vicinity would also be dominated by the substation adjacent to the site to the north and by related transmission lines. The baseline visual quality for foreground views of the power plant site that would include the substation and related transmission lines as dominant elements would be low to moderately low. Although visual quality of foreground views from residences would be adversely impacted by the addition of the power plant, these views would not be reduced substantially below the level of low to moderately low and the visual impacts is expected to be less than significant.

Future views from the Bay Trail that may potentially run near the site would be of concern. However, visual quality of views of the site would be moderately low to low because of the presence of the substation between the potential trail alignment and the site as well as the related transmission lines, and visual quality would not be substantially reduced by the addition of the power plant. In addition, the timing for implementing the trail is unknown and could occur after construction of the substation and power plant; therefore it may not be part of the existing conditions for siting of the power plant. Considering all of these factors, staff does not expect that use of Site Alt-2 would cause significant visual impacts.

The substation and related transmission lines would be likely to cause significant adverse visual impacts for views of the area. The cumulative visual impact of the power plant in combination with the substation and related transmission lines would also be likely to be significant.

Alt-3

Site Alt-3 is located in the City of Fremont in an area designated and zoned for general industrial use, including heavy industry. A portion of the parcel on which the site is located is occupied by the Borden Chemical Plant. A large Celotex

manufacturing plant is immediately northwest of the site. Warehouses are to the northeast. Two 115 kV electric transmission lines and a rail spur are immediately southeast of the site. Other industrial facilities and office buildings are beyond the rail spur and Stewart Road to the southeast and to the southwest across Boyce Road. The nearest residences are in a high-density development in the City of Newark approximately 1/4 mile northwest of the site beyond the Celotex plant. Views southeast toward the site from the residences are largely screened by existing tall trees along Stevenson Boulevard and include views of industrial facilities at the Celotex plant in the foreground. Visual sensitivity for views toward the site from the residences is high. Highway 880, a designated County and City Scenic, Route is located about 3/4 mile northeast of the site and beyond the foreground distance zone. Visual sensitivity for views from the highway would be moderate to moderately high; however the site is not readily visible from the highway. The Bay Trail, an important regional trail, is proposed to be located near and possibly adjacent to the site along Boyce Road. Potential future views from the trail would have high visual sensitivity.

The unity, vividness, and intactness, and therefore visual quality, of views of the immediate vicinity of the site from residences, office buildings, Highway 880, and adjacent streets is low due to the presence of the heavy industrial facilities of the Borden Chemical Plant and the Celotex manufacturing plant. Electrical transmission connection would be to PG&E's Newark Substation, approximately one mile to the south. Land uses along this route are all industrial. The site is close to residences, office buildings, roads, and a potential future trail. A power plant in that location would be a dominant element of views of the area. However, given the visual context of nearby industrial uses and the low visual quality of views toward the site, the power plant would not substantially reduce the visual quality of those views. Although the power plant would not substantially reduce visual quality, it could nevertheless adversely affect views from surrounding locations and would be of concern. In addition, because the timing for implementing the potential future Bay Trail along Boyce Road adjacent to the site is unknown and could occur after construction of the substation and power plant, it may not be part of existing conditions for siting of the power plant. Considering these factors, staff does not expect that use of Site Alt-3 would cause significant visual impacts.

Alt-4

Site Alt-4 is located in the City of Fremont in an area designated and zoned for general industrial use, including heavy industry. Surrounding land uses are primarily industrial and commercial, including a lumberyard, a truck trailer and railcar storage yard, and a large RV storage yard. A huge GM/Toyota car manufacturing plant is approximately 0.5 mile to the south. The closest residence is located east of site Alt-4, approximately 200 feet from the east property line of the site and across Old Warm Springs Road. Four more residences are located along Lopes Court southeast of the site. Foreground views toward the site from these nearby residences have high visual sensitivity. The site is also visible in middleground views from numerous residences on the hills east of Highway 680. These residences have moderately high visual sensitivity for views toward the site.

Existing development in the vicinity of the site blocks most views of the site from other residences and locations farther away.

The site is bounded to the northwest by Fremont Boulevard, a designated Scenic Route by both Alameda County and the City of Fremont. Views toward the site from Fremont Boulevard are in the foreground, are of short duration, and are not in the primary field of view for passing travelers. For these reasons, visual sensitivity is moderate for views of the site and of the background hills from Fremont Boulevard. Old Warm Springs Road is to the northeast and Grimmer Boulevard is to the south. It is assumed that these streets are used primarily for work-related travel and have moderately low to moderate visual sensitivity for foreground views of the site. Highway 880, located just over ½ mile west of the site, is designated by the City and County as a Scenic Route. The visual sensitivity of middleground views toward the site from the highway is moderate because the site is somewhat distant from and not in the primary cone of view of travelers on the scenic highway, and views of the site are limited. Highway 680, located about ½ mile east of the site, is designated by the State, City, and County as a Scenic Route. The visual sensitivity of distant foreground and middleground views toward the site from Highway 680 is moderate because the site is somewhat distant from and not in the primary cone of view of travelers on the scenic highway, and views of the site are limited.

A railroad corridor located within ¼ mile east of the site is proposed for use as a future BART extension. A station is planned for the corridor just south of Grimmer Boulevard. Both the BART line and station would be elevated and are likely to have future views of the site. Visual sensitivity for the line and station for potential future views would be moderately high because of the foreground views of the site for high numbers of travelers with long duration views. Because the timing for implementing the potential future BART line and station along the nearby railroad corridor is unknown and could occur after construction of the power plant, it may not be part of existing conditions for siting of the power plant.

The visual quality of the site and its surroundings is moderately low for all views of the site, except views southeasterly from Fremont Boulevard, due to the presence of numerous industrial facilities and other mixed development surrounding the site with moderately low intactness, unity, and vividness. For southeasterly travelers on Fremont Boulevard, views toward the site include mostly unobstructed views of the background hills, combined with elements of the road in the immediate foreground and surrounding mixed development to create moderate intactness, vividness, and unity and therefore visual quality. Also, other industrial development, including the massive GM/Toyota car manufacturing plant 0.5 mile south of the site, is located along Fremont Boulevard. A power plant on the site would somewhat reduce intactness, unity, and vividness and partially block some views of the hills; and therefore would reduce visual quality from moderate to moderately low. Because the visual sensitivity of these views is moderate and the site would not be in the primary field of view for locations where the power plant would block views of the hills, it is not expected that the visual impact of reducing visual quality for these views from moderate to moderately low would be significant. In addition, the power plant could potentially be positioned on the site and designed using special treatment to help fit it with its surroundings.

Electrical transmission connection would be to PG&E's Newark Substation, approximately two miles to the northwest. One potential route would be underground for approximately 3 miles, first along a corridor that contains an existing 115 kV transmission line then along another corridor that contains two 230 kV transmission lines and one 115 kV transmission line. The second portion of this route is adjacent to existing residences. A second potential route would be approximately 2 ½ miles long following city streets, using either Fremont Boulevard or Old Warm Springs Road and then Automall Parkway. A route using Fremont Boulevard could be either underground or overhead, while a route using Old Warm Springs Road would be underground at least for the portion along Automall Parkway to minimize impacts to nearby residences.

Staff does not expect that an underground transmission line route would cause a significant visual impact. A more detailed assessment of the potential transmission line routes with above-ground components would need to be conducted to more precisely determine potential visual impacts. However, staff expects that significant adverse visual impacts associated with the transmission lines could be avoided or mitigated to less than significant levels. Therefore, considering all of these factors, staff does not expect that use of Site Alt-4 would cause any significant visual impacts.

Alt 5 and Alt-6

Sites Alt-5 and Alt-6 are located in rural eastern Alameda County, adjacent to PG&E's Tesla Substation. The site vicinity consists primarily of gently rolling topography with surrounding rolling hills and open grazed grasslands with few trees. Wind energy development is located to the west, including the western portion of Site Alt-6. The visual quality of the sites and their surroundings is moderately low to low and is degraded by the existing substation, numerous transmission lines crisscrossing the area, and wind development. A transmission line from the site to the substation or to existing transmission lines would be less than 1,000 feet long. The sites are surrounded by hills, blocking views from beyond the hills.

Seven residences are located approximately ½ to ¾ mile south of the sites along Midway Road south of Patterson Pass Road. Although their views toward the sites appear to be partially blocked by terrain, potential middleground views of the sites would be of moderately high visual sensitivity. No other residences in this area have views of the sites.

Patterson Pass Road is designated by Alameda County as a Scenic Route. Travelers on Midway Road and Patterson Pass Road have views of the sites, but traffic is relatively light on these roads. Although it appears that most travelers are commuters, visual sensitivity for foreground views from Patterson Pass Road is high because of its scenic designation. Visual sensitivity for foreground views from Midway Road is moderate to moderately high because of its rural character but low traffic volume and primarily work-related travelers.

A railroad line that carries passengers traveling for work and leisure passes near the sites. However, views of the sites are for a fairly short duration and visual sensitivity for foreground views is moderate.

Although some views of the sites are of moderately high to high visual sensitivity, the existing visual quality of views of the sites and their surroundings is low to moderately low because of the presence of the substation, transmission lines criss-crossing the area, and wind development nearby. The presence of a power plant on the sites would not substantially reduce the intactness, vividness, or unity and therefore visual quality of views of the sites and their surroundings.

Considering all of these factors, staff does not expect that use of Sites Alt-5 or Alt-6 would cause significant visual impacts.

SUMMARY

Staff does not expect that site Alt-1 or Alt-2 would cause a significant project-specific visual impact, so those sites would avoid the significant unmitigable project-specific visual impact of the proposed project. Site Alt-1 or Alt-2 would, with the proposed Los Esteros substation and related transmission lines, likely contribute to a significant cumulative visual impact. Staff does not expect that site Alt-3, Alt-4, Alt-5, or Alt-6 would cause a significant project-specific visual impact or contribute to a significant cumulative visual impact, so those sites would avoid the significant unmitigable project-specific visual impact of the proposed project and, unlike the proposed project, would not contribute to a significant cumulative visual impact.

WASTE MANAGEMENT

ANALYSIS

This analysis discusses the implications of locating the proposed Metcalf Energy Center at various alternative sites with respect to waste management. Wastes would be generated during facility construction and operation.

Construction

Wastes generated during project construction include those related to site preparation as well as construction of the facility. As long as the design of the project does not change significantly, the types and quantities of wastes generated from construction of the actual facility would not vary among sites.

Wastes generated during site preparation could vary, according to the quantity and type of contaminants that might exist at the alternative sites, the need to remove existing structures, and contamination which could exist along the length of linear facilities. Potential sources of site-specific contamination could include existing on-site landfills, unauthorized dumping, spills from hazardous materials containers being transported over or temporarily parked at the site, and migration of chemicals from nearby leaking tanks or waste sites. For instance, leaking storage tanks may be found near a site, and contaminants may migrate onto the site itself. Even

though a site may appear to be vacant with no evidence of contamination, only a detailed investigation can confirm the nature and extent of contamination.

The potential for contamination along linear routes associated with each alternative is unknown without a site-specific assessment. However, the existence of contamination does not usually imply that there would be a significant impact during linear facility construction, since it would be cleaned up, either before or during construction.

If existing structures have to be removed or modified, additional solid or hazardous waste could also be generated.

Alt-1

Site Alt-1 is currently in agricultural use and does not contain any structures that would have to be removed. Because of the agricultural use, there is the potential for pesticide contamination, but this is speculative, and would have to be investigated as part of an Environmental Site Assessment, as would the potential for other types of contamination.

Alt-2

Site Alt-2 is occupied by greenhouses, agricultural facilities, and worker housing. Demolition of these structures would result in solid wastes that would be taken primarily to nonhazardous landfills. However, it is unlikely that such impacts would be significant, due to the availability of regional landfills. Due to agricultural activity at this site, there is the potential for contamination from pesticides.

Alt-3

Site Alt-3 is located on a vacant portion of a parcel near the Borden chemical facility, and contains an evaporation pond on part of it. Staff has no information regarding the use of the pond. Depending on historical practices, there may be significant groundwater contamination from pond leachate, and remediation may be required. Further information and groundwater sampling would be required to more accurately assess the potential for contamination at the site.

Alt-4

Site Alt-4 is a flat, vacant site located in a general industrial area. A car manufacturing plant is about one-half mile to the south of the site. Since this site is in an industrial area, there may be a higher potential for groundwater or soil contamination from past activities onsite, or from migration of toxic substances from nearby sites with leaking tanks.

Alt-5 and Alt-6

Both sites are located in agricultural areas, and are currently used for grazing, as are surrounding lands. Thus, there may be a lower potential for toxic substance contamination than for sites Alt-3 and Alt-4, except for the possibility of pesticides.

Operation

The amounts and types of most wastes generated during routine facility operation, such as used oil, solvents, batteries, air pollution control catalyst, and the like, are a function of facility design, and not location. However, wastes generated from treating water used in plant operations could vary, depending on the quality of the source water. Types and amounts of normally occurring constituents can vary greatly in ground and surface water supplies, and the use of reclaimed water may require special treatment options. In addition, site specific considerations may lead to differences in wastewater disposal options, such as zero discharge or the use of evaporation ponds, which in turn may influence the quantity and types of wastes generated from water treatment and use. However, site specific differences in water supply and quality may not lead to significant differences in waste management impacts, because these are usually either minor or can be mitigated successfully.

SUMMARY

Staff has concluded in the **WASTE MANAGEMENT** section of the FSA that the proposed project would not be likely to cause any significant adverse impacts from waste management.

Staff has no site-specific information concerning contamination that may be associated with leaking underground tanks, landfills, past releases of hazardous materials, contaminated wells, etc. at the six alternative sites. Thus, until a site is investigated specifically, the amount of hazardous or nonhazardous waste that may be generated during site preparation is speculative. Sites Alt-1, 2, 5, and 6 are located in agricultural areas, as is the proposed site, so all of these sites may in general have a similar potential for soil contamination, lower than sites Alt-3 and 4, which are located in industrial areas. There is an existing evaporation pond on a portion of site Alt-3, which may also indicate a higher probability of having to manage contaminated soil or groundwater. Except in those instances where there is extensive site contamination resulting from decades of industrial use, management of hazardous wastes from site cleanup activities can be accomplished without significant adverse environmental impacts.

The quantity and types of project wastes due to project operation could differ between the alternative sites, and between the alternative sites and the proposed site. However the likelihood is that any differences would be minor.

COMPARISON OF STAFF ALTERNATIVE SITES AND THE PROPOSED SITE

ALTERNATIVES Table 4 shows staff's assessment of the expected environmental impacts of the proposed project and of use of staff's alternative sites.

SUMMARY

Staff expects use of alternative site Alt-1 or Alt-2 is expected to avoid at least one of the significant environmental impacts of the proposed project. They would also result in significant adverse land use impacts due to the loss of prime farm land and may have significant adverse cumulative visual impacts. Use of either site would

require a General Plan and zoning change. Use of alternative site Alt-3 or Alt-4 is expected to avoid the significant environmental impacts of the proposed project and is not expected to cause any significant impacts. A power plant located at either of these sites would not require a General Plan amendment or zoning change but would not be in compliance with height restrictions in the City of Fremont's General Plan. Use of alternative site Alt-5 or Alt-6 is expected to avoid the significant environmental impacts of the proposed project but may cause significant adverse biological and water impacts. They would not require a General Plan or zoning change.

THE "NO PROJECT" ALTERNATIVE

The CEQA Guidelines and Energy Commission regulations require the evaluation of the "no project" alternative along with its impact. The Guidelines state that

"The purpose of describing and analyzing a no project alternative is to allow decisionmakers to compare the impacts of approving the proposed project with the impacts of not approving the proposed project" (Section 15126.6(e)(1)).

If the proposed project is not approved, a power plant would not be built on the proposed site at the northern end of Coyote Valley. Also, new electric, gas, water, and wastewater lines would not be built, a gas metering station on the east side of Highway 101 would not be built, and potential new water wells would not be drilled.

Pursuant to the CEQA Guidelines, this analysis discusses the no project alternative based on "the existing conditions at the time environmental analysis was commenced, as well as what would be reasonably expected to occur in the foreseeable future if the project were not approved, based on current plans and consistent with available infrastructure and community services" (Cal. Code Regs., tit.14, § 15126.6(e)(2)).

EXISTING CONDITIONS - CURRENT ENVIRONMENTAL SETTING

The existing conditions at the proposed power plant site consist of rural residential and agricultural (poultry production) uses on the northern half of the site and row crops on the southern half. A large group of mature deciduous trees, including black walnuts, separates the northern and southern portions of the site. Substantial acreage used for row crops with scattered rural residences lies south and southeast of the site, including six residences along Blanchard Road, approximately ¼ mile from the site. Fisher Creek borders the western and northern sides of the site, at the base of Tulare Hill, which is used for cattle grazing. Directly northeast of the site are the Southern Pacific Railroad tracks, with Monterey Road farther to the northeast. Beyond Monterey Road are Coyote Creek and U.S. Highway 101. Several large electrical transmission lines cross Tulare Hill just northwest of the site.

CONDITIONS REASONABLY EXPECTED TO OCCUR

ON-SITE

If the proposed Metcalf project is not approved, it is foreseeable that the site could be developed for campus industrial use, in keeping with the City of San Jose's plans for the area. Assuming the same number of workers per acre as for the proposed CISCO project, a campus industrial development on the proposed site would employ approximately 200 workers.

OFF-SITE

Because of electrical supply and reliability problems, if the proposed Metcalf project is not licensed and constructed, it is reasonably foreseeable that one or more other power plants with a total generating capacity similar to the proposed project would be constructed in the South Bay area or the Greater Bay Area in the near future.

Until and unless such electric generation becomes available, it is reasonably foreseeable that temporary generation will be used and additional transmission facilities will be built.

The President and Chief Executive Officer of the California Independent System Operator (ISO) has recently stated in a letter to the Metcalf AFC Committee (Winter 2000) that

"ISO studies show that, with no major generation supply, the San Jose area is the most vulnerable metropolitan area on the PG&E system for local system problems. If new generation is not developed (and none other than MEC currently appears likely in the area), major transmission facilities will be needed."

Prior to this letter, the ISO approved several PG&E transmission system projects outside of the annual transmission expansion planning cycle. These include the following:

- Reconductor Pittsburg-Tassajara 230 kV line.
- Split Metcalf-Monta Vista 230 kV line into 2 circuits.
- New (3rd) Tesla 500 kV transformer.
- New Newark-Tesla 230 kV line.
- Loop Newark-San Mateo 230 kV line into Ravenswood.
- Add 350 MVAR static capacitors to Metcalf 500 kV bus.
- Add 100 MVAR static capacitors to Martin 115 kV bus.

Staff included these projects in its system modeling for the local system effects analysis (see the **LOCAL SYSTEM BENEFITS** section of the FSA). These projects will improve the electrical transmission system in the South Bay area, but will not solve all transmission system problems cited in the ISO letter.

In addition, staff's local system effects analysis has determined that some additional actions will likely be required to address load growth in the South Bay area in the absence of MEC. Staff's analysis identified a number of projected reliability criteria

violations in the Bay Area. Staff also identified the following possible six transmission grid capital facility projects that could be required to avoid those reliability criteria violations projected to occur if MEC is not built:

1. 3rd Metcalf 500/230 kV transformer,
2. Contra Costa - Eastshore 230 kV line reinforcement,
3. Newark - Ravenswood 230 kV line reinforcement,
4. Castro Valley - Newark 230 kV line reinforcement,
5. Tassajara - TES Junction 230 kV line reinforcement, and
6. Voltage support to mitigate low voltages at 107 substations.

Staff's local system effects testimony states that MEC might allow deferral or relocation of these projects.

The ISO letter also refers to the potential need for "temporary generation in key locations in deficient areas." In fact, the ISO has issued a request for proposals for temporary generation projects. Some of these projects may be proposed for the South Bay area. The projects typically have a capacity of approximately 90 MW each, and are planned to be operational for the summer 2001 peak, with possible extensions for 2002 and 2003 (Mackin 2000). If large-scale, permanent generation is not constructed by then, temporary generation could be extended.

If the actions discussed above are not taken, rolling black-outs as experienced during the summer of 2000 may occur with their potential social, economic, public health and environmental consequences.

COMPARISON OF THE ENVIRONMENTAL IMPACTS/CONSEQUENCES OF THE MEC PROJECT AGAINST THE NO PROJECT ALTERNATIVE

SUMMARY OF THE SIGNIFICANT IMPACTS OF THE PROPOSED PROJECT

Staff had determined that the proposed project would cause significant unmitigated land use and visual impacts. (see the **LAND USE** and **VISUAL RESOURCES** sections of the FSA).

THE SIGNIFICANT ENVIRONMENTAL IMPACTS OF THE PROPOSED PROJECT EXPECTED TO BE AVOIDED OR SUBSTANTIALLY REDUCED BY THE NO PROJECT ALTERNATIVE

The no project alternative would substantially lessen the significant visual impacts of the proposed project. The inherent characteristics of the proposed project, especially the HRSG stacks, that give the power plant an industrial character and would not be mitigated, would contribute to the significant visual impacts that it would cause (see the **VISUAL RESOURCES** section of the FSA). Campus industrial development on the site in adherence to the City's guidelines and standards would not have these

industrial characteristics, would potentially preserve the central grove of trees and views of the surrounding hills, and would employ other means of fitting the development with the rural character of its surroundings, so the proposed project would have greater visual impacts than would campus industrial development of the site.

THE ENVIRONMENTAL IMPACTS OF THE NO PROJECT ALTERNATIVE

ON-SITE IMPACTS

Until and unless the proposed site is developed for another project, the no project alternative would not cause any significant environmental impacts at the site.

The reasonably foreseeable development of the site for campus industrial use would cause a significant unavoidable land use impact due to the conversion of prime farmland to non-agricultural use. The development may also have the potential to cause significant noise, visual, and traffic impacts. It is expected that noise and traffic impacts could be mitigated to less than significant levels. It may be that potential project and cumulative visual impacts, although potentially less than those of the proposed project, would not be mitigable to less than significant levels.

OFF-SITE IMPACTS

The ISO letter stated that some transmission facilities that would be needed without the MEC could require new right-of-way, with attendant environmental impacts. None of the six potential projects that staff has identified would require new right-of-way. It is uncertain whether any potential projects that the proposed project may defer would require new right-of-way.

Detailed environmental evaluation of these recently identified potential grid projects is beyond the scope of this analysis. In general, when transmission projects cause significant environmental impacts, they are commonly in regard to biological resources, land use, visual resources, or cultural resources. However, the potential for significant environmental impacts is generally much less for reconductoring than for construction in new right-of-way. In addition, often the impacts of transmission line projects can be reduced to less than significant levels through mitigation. Also, projects within the boundaries of an existing substation, such as installing capacitors for voltage support (project 6 above) or installing a new transformer (project 1 above) typically do not cause significant environmental impacts.

It is important to note that potential for the proposed MEC project to defer these transmission projects is higher than the potential to preclude (permanently defer) them. It cannot be confidently predicted that the facilities, especially the reconductoring projects, would never be needed. Therefore, the environmental benefits of the MEC project would more likely be limited to deferring the environmental impacts of the transmission projects for an undetermined period, rather than avoiding them. Technical staff has estimated that the proposed project could defer the 3rd 500/230 kV transformer at Metcalf Substation (project 1 above) for approximately four years. It is highly likely that if the MEC is not built, that transformer will be required (see the **LOCAL SYSTEM EFFECTS** section of the

Final Staff Assessment). It is not certain that any of the five remaining specific projects would occur if the MEC project is not approved, so any environmental impacts related to these projects may not occur.

The ISO letter also states that

“The amount of new generation proposed to be on-line in the next two years will not be sufficient to cover our projected deficiency plus the load growth. Without the Metcalf Energy Center, there will be a greater deficiency of 600 MW starting in 2002.

“Should shortages occur, the ISO could be forced to implement rolling blackouts of customers, such as occurred in the Greater San Francisco Bay Area on June 14, 2000. The ISO is committed to doing everything in our power to prevent these actions, such as providing financial incentives for installing temporary generation in key locations in deficient areas. New generation at Metcalf will be a permanent means to defer these extreme measures in the foreseeable future” (Winter 2000).

ISO staff has clarified that if the transmission projects approved by the ISO in August of this year (described above) are in service by 2001, the most likely cause of rolling blackouts in the San Jose area is likely to be a statewide shortage of generation rather than a transmission related deficiency in the San Jose area or the larger Bay Area (Mackin 2000). The benefit of MEC in reducing the potential for rolling blackouts would primarily come from reducing the overall statewide shortage of power, and thus MEC would reduce the potential for rolling blackouts statewide, including the San Jose area.

The June 14, 2000 blackout referred to in the ISO letter was not caused by a statewide lack of power, but rather by local voltage stability problems caused by a lack of local generation and insufficient local transmission in the Bay Area. MEC's effect of adding local generation and of increasing the reactive margin at key Bay Area substations such as Metcalf and Newark would help to alleviate such problems.

The ISO letter further states that

“In addition, the construction of major new transmission facilities can take many years to permit and construct. It is questionable whether these transmission facilities could be built in time to meet the area's growth” (Winter 2000).

Uncertainty exists regarding how long would be required to permit and construct the transmission projects that may be built if MEC is not approved. However, uncertainty also exists regarding when MEC would be in operation. It may not be feasible for MEC to meet its objective of being on line by the 2002 summer peak.

The ISO letter refers to the potential need for “temporary generation in key locations in deficient areas.” In fact, the ISO has issued a request for proposals for temporary generation projects. Some of these projects may be proposed for the South Bay

area. The projects typically have a capacity of approximately 90 MW each, and are planned to be operational for the summer 2001 peak, with possible extensions for 2002 and 2003 (Mackin 2000).

The environmental impacts of temporary generation have not been fully evaluated. Temporary generation is expected to have emission rates at least twice that of the MEC and could cause greater air pollutant emissions. If the current regulatory framework remains in place and is implemented for such temporary generation, projects either will be required to provide offsets or will have emission levels that do not require offsets and are considered mitigated by the air district's air quality program (Layton 2000), so air quality impacts would not be significant. Such projects may be between 50 and 100 megawatts and likely located at or near existing electric substations.

There is a reliability benefit associated with locating generation near the significant load in San Jose. If the MEC project is not licensed and built, this reliability benefit will be foregone until additional permanent generation is built. Although it is impossible to accurately calculate the likelihood of a San Jose outage, such an outage is certainly greater without MEC than with it. If an outage occurs, there is an increased risk of significant public health consequences.

For example, if a power outage occurs during or is precipitated by a period of extreme heat it can have profound effects on sensitive populations. Sensitive populations are often dependent on air conditioning to avoid aggravation of chronic health conditions such as chronic obstructive pulmonary disease or acute health effects such as heat stroke. It is widely recognized that hot weather conditions can significantly increase both morbidity and mortality, particularly among sensitive populations such as the very young, the elderly, and those with chronic diseases (Bridgerand and Heland 1968) (Schickele 1947) (Oeshli and Buechley 1970). Thus, shortages of electricity can impose risk of very serious impacts on the public, potentially increasing the risk of deaths due to heat waves. Staff believes that reducing risk by improving electrical system reliability during heat waves is a significant public health benefit of the project.

THE ENVIRONMENTAL IMPACTS OF THE PROPOSED PROJECT COMPARED TO THE ENVIRONMENTAL IMPACTS ASSOCIATED WITH THE NO PROJECT ALTERNATIVE

The proposed project would cause the significant, unmitigable impact of the loss of 22.5 acres of prime farmland. (See the **LAND USE** section of the FSA). If the project is not approved, if and when the site is developed, such as for campus industrial use, a similar acreage of prime farmland would also be lost. It is not certain if and when the site would be developed if the project is not approved. Even if it is developed, the loss of prime farmland would be deferred until the land is developed. (The area, including the proposed power plant site, has been designated for campus industrial use since 1985, but it has remained in agricultural use.) None of the identified transmission projects that may be deferred if MEC is built are expected to cause the loss of prime farmland, because they are either improvements within an existing substation or reconductoring of existing transmission lines. It is uncertain whether potential construction of other permanent

generation in the South Bay area or the Greater Bay would convert prime farmland. However, very little prime farmland remains in those areas. Therefore, the total acreage of prime farmland that may eventually be lost under the no project alternative is expected to be approximately the same as or less than the proposed project.

Approximately 200 workers would likely be employed with planned future campus industrial development of the site, compared to approximately 20 for the proposed project. This would mean more traffic contributing to traffic congestion. It is uncertain whether this impact would be significant either by itself or as a contribution to cumulative traffic impacts. It is also uncertain whether any such potential significant impact could be reduced to a less than significant level. It is also uncertain how the air quality impacts of traffic from campus industrial use of the site would compare to the air quality impacts due to the combination of traffic from power plant use of the site and the emissions from the power plant.

The proposed project, unlike a campus industrial development, would have the benefit of using recycled water. (See the **SOIL AND WATER RESOURCES** section of the FSA).

NON-ENVIRONMENTAL EFFECTS OF THE NO PROJECT ALTERNATIVE

The purpose of this discussion is to provide decisionmakers with information regarding whether any benefits of the proposed project, compared to the no project alternative, are sufficient to override the significant unmitigable environmental impacts of the proposed project.

LOCAL ELECTRICAL SYSTEM BENEFITS

POTENTIAL TRANSMISSION GRID CAPITAL FACILITY PROJECTS

The proposed project would provide a number of benefits to the local electrical system. (See the **LOCAL SYSTEM EFFECTS** section of the FSA for a detailed discussion of this topic.). As previously discussed, staff's local system effects analysis has determined that if MEC is not built, some additional actions must be taken to address load growth in the South Bay area. Staff expects that the six potential transmission grid capital facility projects that staff has identified would have the following local system effects:

1. *Reduction in system losses*: The effect would be insignificant because the reduction of system losses would be very minor.
2. *Improved outage performance*: The transmission projects would be designed to create outage performance equal to that of MEC.
3. *Increased real and reactive power (decreased need for imports and local reactive facilities)*: No change in the need for imports. There would be increased local reactive power (but whether the increase was equivalent to MEC would

depend on the design of the reactive support facilities actually proposed. This type of determination is beyond the scope of staff's analysis.

4. *Increased reactive margin (voltage or VARs support) resulting in increased local area reliability and assist in maintenance of interconnected system reliability (reduction in potential blackouts):* This type of determination is beyond the scope of staff's analysis.
5. *Additional operational flexibility:* No significant addition.
6. *Reduced reliability must run (RMR) costs:* No likely decrease in costs.
7. *Potential deferral or relocation of capital facilities:* The third 500KV/230KV Metcalf transformer would not be deferred for four years.

POTENTIAL TEMPORARY GENERATION PROJECTS

Technical staff expects that potential temporary generation projects that may operate if MEC is not built would have the following local system effects:

1. *Reduction in system losses:* The reduction of system losses would be very small because the temporary generation would only run for a few hours every year, while the MEC is likely to run over 8000 hours per year.
2. *Improved outage performance:* Temporary generation is not likely to create outage performance equal to that of MEC. In order for outage performance to be equal, the total generation would have to be of equal size to MEC and also be located in very close proximity (electrically) to Metcalf Substation.
3. *Increased real and reactive power (decreased need for imports and local reactive facilities):* There would be a decrease in the need for imports equal to the output of the temporary generation only during the times that the generation is operating. However, it is likely that the need for imports would only be reduced during a few peak hours each year. There will be increased local reactive power generated by the temporary generation, but, again, this additional reactive power will only be available during the few hours that the temporary generation is operating.
4. *Increased reactive margin (voltage or VARs support) resulting in increased local area reliability and assist in maintenance of interconnected system reliability (reduction in potential blackouts):* This type of determination is beyond the scope of staff's analysis.
5. *Additional operational flexibility:* Additional operational flexibility would be minor because this generation can only be operated for a limited number of hours each year. The times when MEC would provide most of the added operational flexibility would be times when the temporary generation would not be operating.

6. *Reduced reliability must run (RMR) costs:* RMR costs are not likely to be substantially decreased. All current units would need to remain RMR, and the temporary generation would only operate during peak load conditions. During the partial-peak and off-peak hours where MEC would provide most of its potential RMR cost savings, the temporary generation would be off-line. The cost of temporary generation also needs to be considered.
7. *Potential deferral or relocation of capital facilities:* Temporary generation projects are not intended to allow deferral or relocation of capital facilities.

RAPIDITY OF IMPLEMENTATION

The applicant has stated that the proposed project will be on line by the summer 2002 peak electrical demand.

The letter from the President and Executive Director of the ISO (Winter 2000), discussed previously, also states that:

“the construction of major new transmission facilities can take many years to permit and construct. It is questionable whether these transmission facilities could be built in time to meet the area’s growth.”

Staff expects that if the third Metcalf 500/230 kV transformer is needed in 2002, it can probably be in service by then. Staff’s analysis did not identify any other transmission projects that would be needed by 2002. The other projects were identified as needed in 2005. The analysis determined that the other projects would be needed in 2005, but did not examine whether they would be needed in 2003 or 2004. Staff assumed that these projects could be operational by 2005 as the basis for identifying potential benefits from MEC’s deferral of the projects.

ECONOMIC COSTS AND SOCIAL COSTS

Rolling blackouts, instituted to maintain electrical system reliability, can cause economic costs to industry and business and disrupt the lifestyle of members of the public. The effect that the proposed project would have on the potential for rolling blackouts compared to the effect of the no project alternative is uncertain. The transmission system projects that would have otherwise been deferred as well as temporary generation would provide some of the reduction in the risk of rolling blackouts that the proposed project would provide.

The cost of providing financial incentives for installing temporary generation would be paid by the electricity ratepayers.

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DECLARATIONS AND RESUMES